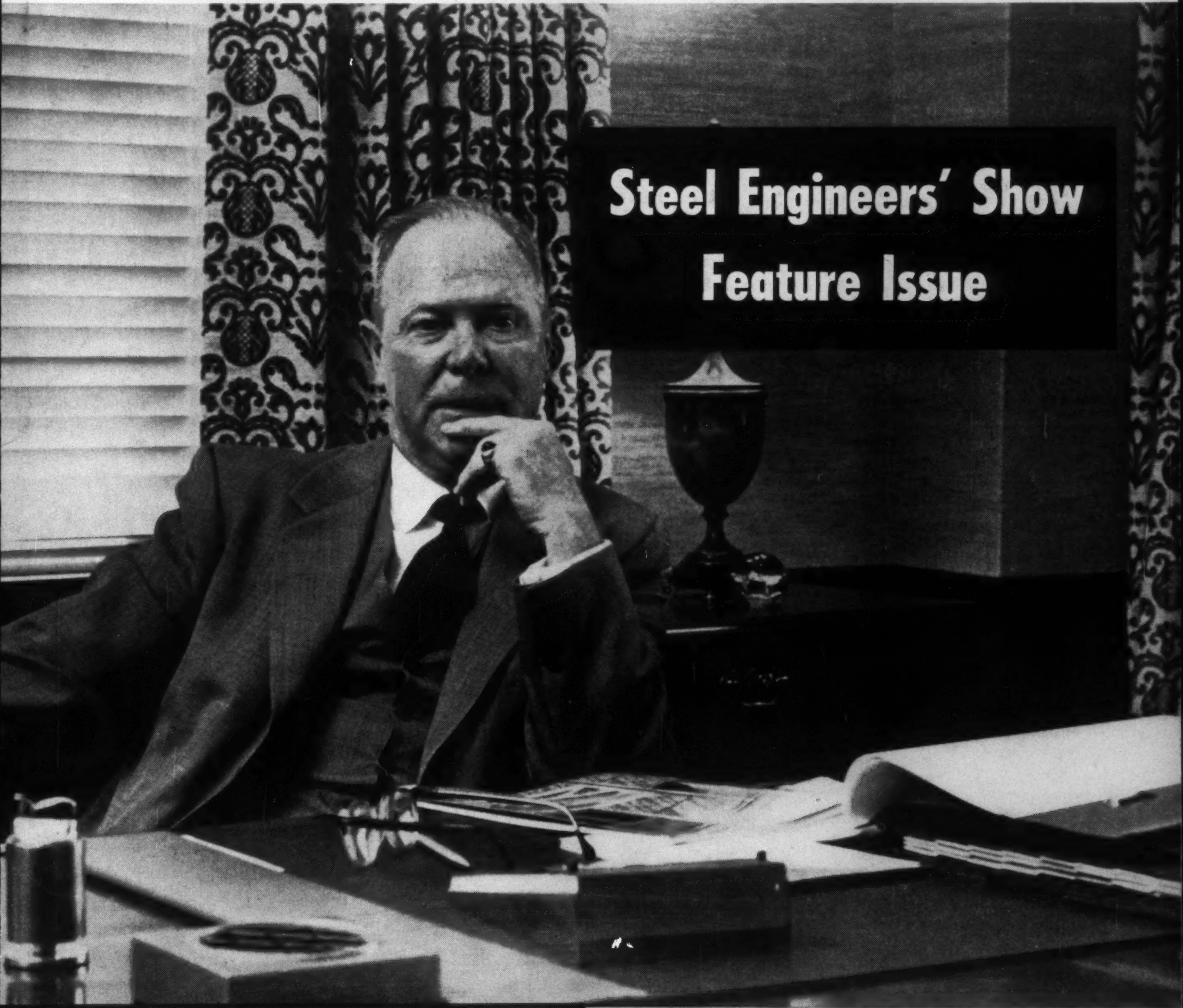
IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication SEPTEMBER 15, 1960



Steel Engineers' Show Feature Issue

★ Allegheny Ludlum's E. J. Hanley Answers—

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Price of Executive Success p. 120

Steelmakers React to New Methods p. 153

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MESTA ROLLS

for Quality and Tonnage....

MESTA HEAT TREATED SPECIAL ALLOY CAST STEEL BACKING-UP ROLLS

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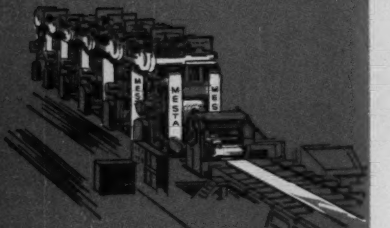
Tandem Cold Mills and Temper Mills
rolling ferrous and non-ferrous metals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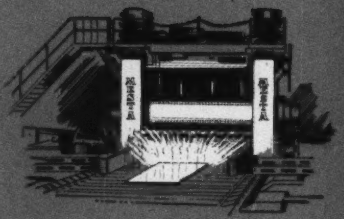
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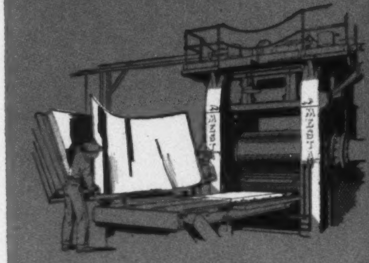
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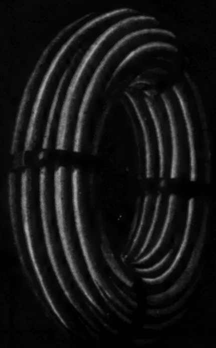

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○ □ ⬡	SIZE RANGE, in.	COIL WEIGHTS, lb., average
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SQUARES	9/16 to 13/16 27/32 to 1 1/8	850, 1600 850, 1600, 1750
HEXAGONS	9/16 to 13/16 27/32 to 1 1/4	850, 1600 850, 1600, 1750

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The IRON AGE

September 15, 1960—Vol. 186, No. 11

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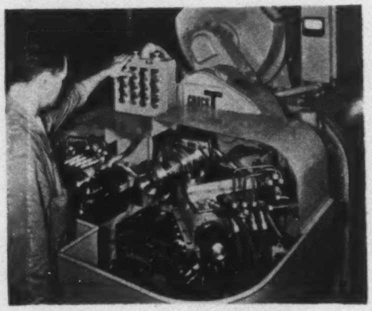
News of the Industry

TOOL SHOW

New Trends—Visitors to the National Machine Tool Exposition in Chicago are noting two trends. One is toward tape controls and the other is a move in the direction of miniature space age tools. P. 115



BUSINESS POLITICS

More Effort — Experts disagree on business' role in politics, but all agree it isn't doing a thorough job politically. A long range program is needed. P. 117

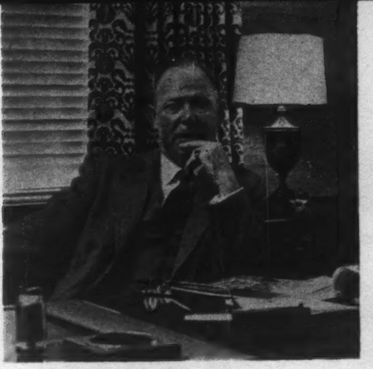
DISTRIBUTOR COUNCIL

Pays Off For Manufacturer—SKF Industries found an effective way to keep its distributors sold on the company. It's a council controlled and directed by the members. P. 118

NEW TOOL

Closer Look—A new tool developed for Jones & Laughlin Steel Corp. allows a closer look at steel

Metalworking



Cover Feature

STEEL INDUSTRY'S FUTURE —This is E. J. Hanley, president, Allegheny Ludlum Steel Corp. In an exclusive IRON AGE interview he discusses the new competitive market in steel. P. 113

composition and may lead to new and better products. P. 119

EXECUTIVE SUCCESS

Self-Appraisal—In the second of Dr. Gaudet's articles on executive success he shows how to take a personal inventory to find if you have the "stuff" to really move up. P. 120

Engineering-Production Developments

MODERN STEELMAKING

Stimulates Research—The steel industry is reacting with new speed and boldness in many diversified areas. This new mood shows up in the vast programs of ore beneficiation; in the rapid swing to open-hearth oxygen; and in new methods of blast furnace operation. However, some people feel this country is still on the sluggish side when it comes to blazing new development trails. P. 153

DEMAND FOR PELLETS

Hits Record High—Blast furnace operators are the fair-haired boys of the operating departments in most steel mills. Why? Because they are producing more iron with the same old furnaces. The breakthrough is the result of upgraded iron ore and improved methods of furnace operation. P. 159

NEW WORLD - WIDE TRENDS

Brighten Steel Outlook — Last year's strike forced many American companies to get steel from foreign sources. Even now, though the strike is over, imports continue to pour through U. S. ports. Foreign countries have made inroads into markets formerly covered by American steelmakers. However, these gains appear to be temporary. If full employment continues, foreign steelmakers will soon face price problems. P. 162

THINKING COMPUTER

Will Control Steel Mill — Next year, a computer-controlled mill is scheduled to make its debut. This mill will be able to "think." If strip isn't up to specifications, the computer will adjust the line. If the strip is beyond correction, the computer will label it as scrap. P. 166

Market and Price Trends

AUTOMOTIVE

Double Trouble—Chrysler Corp. is facing double trouble this year. With the public still talking about the dismissal of William Newberg, Chrysler must plan for new high-level personnel. Also a tough 1961 market awaits. P. 127

WEST COAST

Expansion Without Letup—Growth of new or expanding companies continues in the Farwest. As a result, the area keeps widening its product base. P. 129

STEEL SUMMARY

Another Setback—Lack of new buying trends may erase hopes for an October recovery in the industry. There is now a slight seasonal upturn in orders, but it calls for light tonnages. The current recession in steelmaking can no longer be called an inventory correction period. Recovery may come next March. P. 239

PURCHASING

Value Analysis Manual—A new booklet on value analysis is available to buyers. Issued by the National Association of Purchasing Agents, it is a primer for the "uninitiated." P. 240

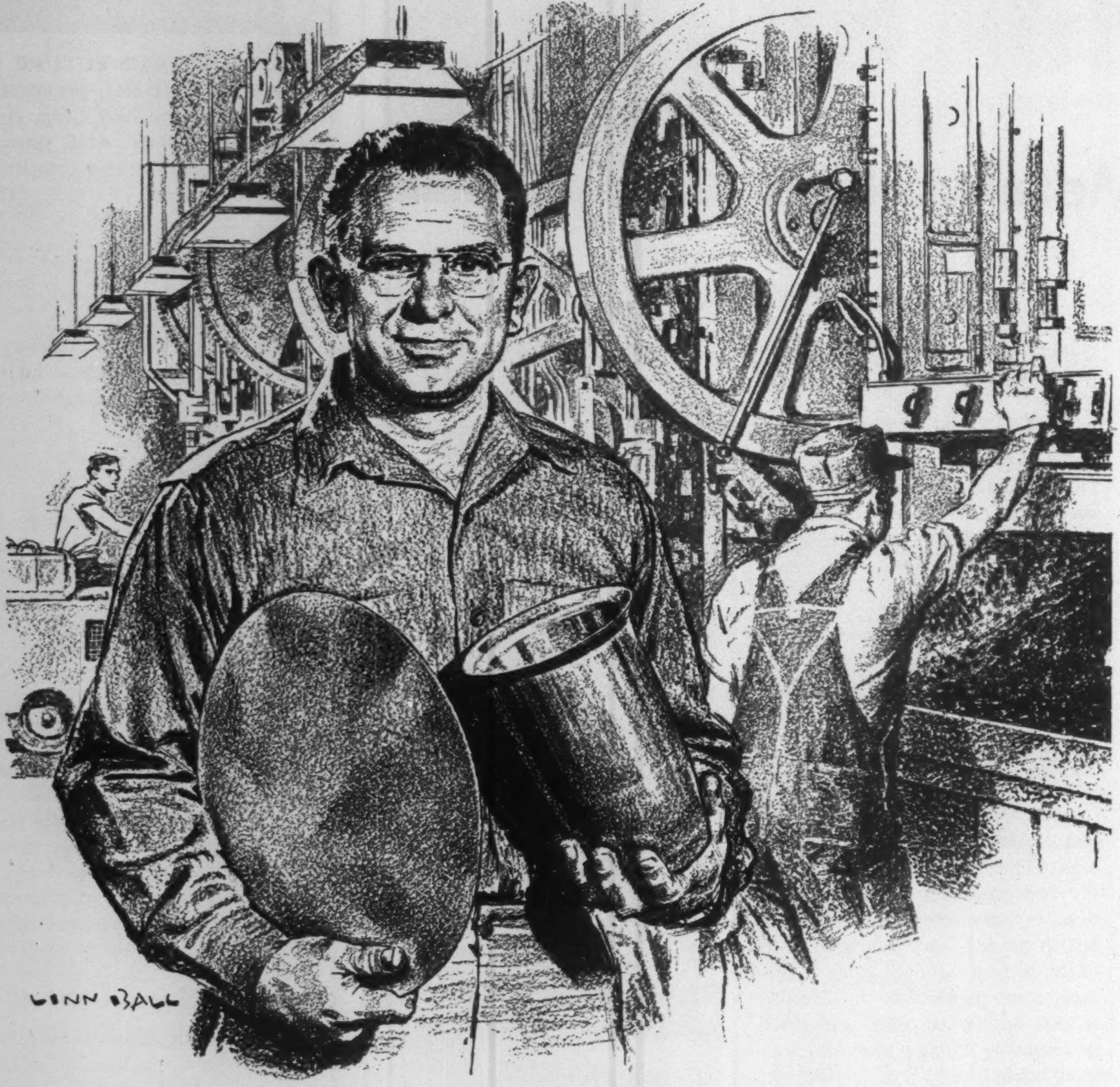
NEXT WEEK

CAPITAL GOODS

1961 Outlook — Companies appropriated less money for capital spending in the second quarter. This means less capital goods orders in first quarter '61. See next week's survey of metalworking capital appropriations.

AUTOMATIC FABRICATION

New Method — A new machine for automatically fabricating, new webbed-type structural components is now getting underway. It may well revolutionize this phase of the industry. A full report will appear next week.



"For extra deep drawing we like Sharon Quality Stainless Steels" — WALTER MARKOWSKI, Pressroom Foreman
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"Here at Farber we really put stainless steel through severe tests," says Walter Markowski, pressroom foreman. Our product design calls for extra deep draws, delicate rolled edging and bright flawless finishes. Over the years we have found a most dependable source of prime stainless steels in the *Sharon Steel Corporation, Sharon, Pa.*"

SHARONSTEEL

SHARON Quality STEEL

Our National Issues: What Do We Do About Them?

It seems that most everyone is either writing about national issues or talking about them. So much so that there may be few listeners. Yet this frame of mind in the nation is a good one. It is probably more positive than any in recent years.

The two strong and knowledgeable presidential aspirants are partly responsible for our interest in issues. But they are not the basic reason for our personal reappraisals. Columnists are partly responsible. Cold hard facts of international life have contributed to our alertness. And probably the atom age accounts far more for our thinking than we know.

There is a tendency to believe that the so-called thinking person has a corner on the crisis market—that he sees farther ahead and recognizes the dangers better than does the man on the street. That may be so. But even the most thoughtful ones need a leader. A nation does not go forward without leadership, something we have hardly ever lacked.

The every-day person is often so swamped with problems of immaturity, child raising, emotionalism, associations, and trying to make ends meet that the "big" picture is supposed to escape him. Maybe it does. But if he misses it in detail—as some of the deeper thinkers believe—he still senses what is going on in the world.

So it is with our national issues. Some of us call them goals. Others refer to them as problems. Most of the fire and brimstone over them suggests that, as a nation, we are not what we ought to be. There seems to be a sense of national anxiety.

One thing is certain: These feelings of quiet alarm, of a lack of well-being or of impending catastrophe are not the private property of any one class—or of any one age. They are affecting all of us—more so than in the past.

But this time it will take a continuation of our past leadership, and then some. That leadership must be sharper, more aware of international snares, and patient but strong enough to shock us into seeing clearly our responsibilities.

People do not lead—they are led. They are led for good or evil. Both presidential candidates want to lead all of us for our own good, for our nation's good and for our children's good.

Tom Campbell

Editor-in-Chief

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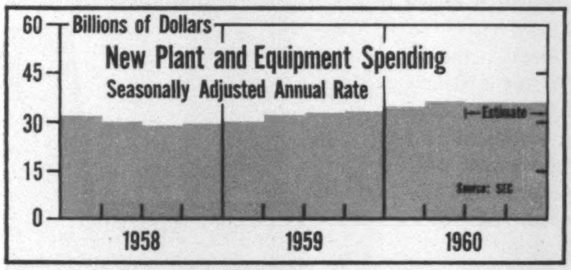
Is Capital Spending Leveling?



New plant and equipment spending appears to be leveling at the $36.9 billion annual rate. That's what latest government survey figures indicate. However, since earlier quarterly forecasts have been on the high side, it's likely that spending will decline in the fourth quarter.

In any case, the optimistic $37 billion forecast for the year is now out of the question. The best that can be hoped for now is $36.4 billion. Furthermore, spot checks around industry show that more companies are "taking another look" at spending plans.

A Late Year Pickup?

Possibly motivated by politics, government economists say there is a chance for a pickup in business activity during the final three months of this year. The optimistic statement follows the latest figures on capital spending plans (see above). The economists contend that although there is no major expansionary force prodding the economy upward, it is holding at a record high.

Business Failures Decline

The up-and-down character of the rate of business failures doesn't indicate any real trend. From the previous week's eleven-week high of 315, failures in the week ended Sept. 1 declined to 288. This is also under the year-ago rate of 308 for the same week in 1959.

Consumption: The Real Headache

The development that is causing increasing concern in the steel industry is the realization that the slump is much more than an inventory correction. When the market began to soften earlier in the year, a rebound was expected when inventories were brought into line. But this did not occur. The gloomy fact is that actual steel consumption is much slower than almost anyone in the industry had expected.

Colbert Takes the Bright View

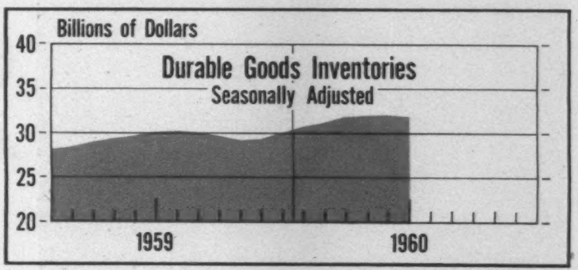
L. L. Colbert, Chrysler chairman, believes business is in for a pickup. His reasoning: "Low levels of activity in steel, home building, and petroleum experienced in the spring and early summer may have served to prevent an inventory adjustment later. I'm strongly inclined to the view that we have already experienced our 'rolling adjustment' and that business out ahead will be stable and rising."

Year Ago Comparisons

In making your analyses of business statistics, make allowances in comparisons with "year ago" figures. Just a year ago, the nation was in the midst of the longest steel strike. This affects many sets of statistics from production down through freight car loadings.

Inventory Control Takes Effect

Inventory control, which actually has been in progress for many months, is finally showing up in statistics. Durable manufacturing inventories in July declined $200 million to $54.9 billion. Reason for the statistical lag: Although inventory control was in effect long ago, rate of consumption also declined. Overall inventories declined only $100 million during July as retail inventories gained $100 million. Nondurable manufacturing inventories held at $22.9 billion.



Auto Industry Output Tops '59

Auto industry output so far in 1960 is running well ahead of last year's levels. Production through Sept. 3 was 5,453,018 vehicles, compared with 4,933,604 units for the same period in '59, according to the Automobile Manufacturers Assn.

No shelf-warmers here! They're made of fast-moving Olin Aluminum

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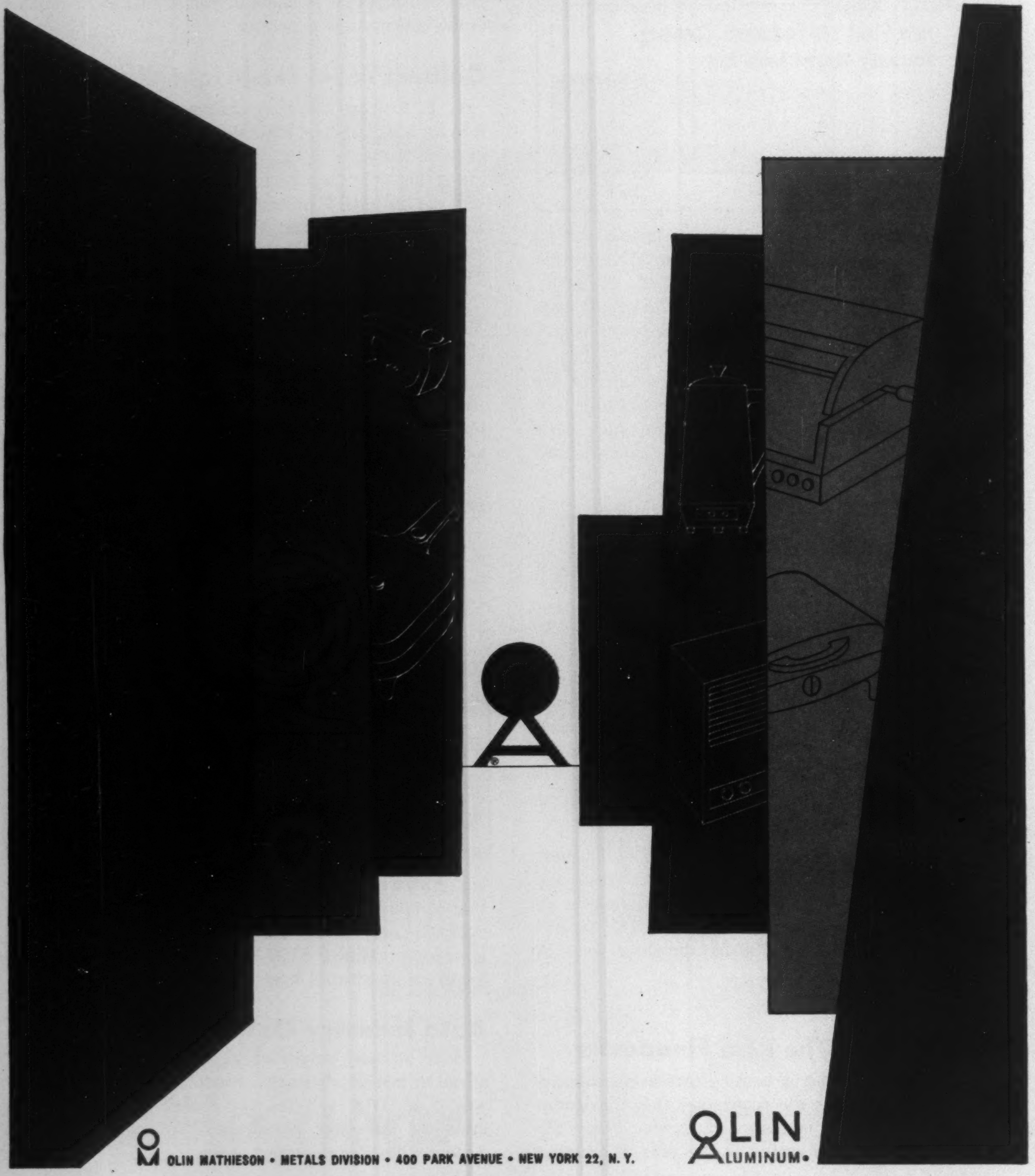

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Work Rule Symptoms

LOCAL 2013
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P.R.R.

QUILL: A symptom?

The railroad labor troubles have greater significance than a stopping of the roads, costly as it is to the railroads and users.

It's another symptom of management's determination to fight to get rid of work rules which are unfair, wasteful, or mere featherbedding. This was apparent in last year's steel strike and failure to settle the issue then means more trouble later.

This fight will go into the 60's and, as a single issue, may take precedence over wages and fringes. Eventually, the issue will have to be decided: Either management will be able to establish the rules, or labor will win the fight to get paid tremendous funds for phantom work.

At the bottom of the whole question is the fear of automation and the drive for job security on the part of the unions on the one hand and management's desire to hold the line or regain prerogatives where it has yielded too much in the past.

Unions Reject GE, Westinghouse Plan

Last week, Westinghouse followed General Electric with a three-year contract offer and it was rejected just as summarily as the GE plan. (IRON AGE, Sept. 8, p. 61)

While the rejection was no particular surprise in either case, it could mean a tough negotiation period ahead. GE in particular has taken a stern position in advance of the upcoming contract talks.

The rejection was on a broader base than the militant stand by the IUE's James B. Carey.

USWA: Election Plans

Next week the Steelworkers gather at Atlantic City for their convention. Two elections will be on the minds of the delegates.

One is the election of the President of the United States. The other will be the next election, in 1961, of the president of the USWA.

Steelworker president McDonald will use the convention for his purposes in both elections. He has been working for Sen. Kennedy for months and will use the convention to boost the Senator. Through others, he will use the convention to bolster his own position for re-election.

Little resistance is expected on the convention floor to any McDonald-inspired resolutions, projects, or election plans.

And chances are he will get a resounding ovation for the latest Steelworkers' contract. But there will be little or no mention of Vice President Nixon or his part in delivering a settlement as much for the union as for management.

Production Worker Profile

Meet the Cleveland hourly paid manufacturing employee! What does he earn? What fringe benefits does he have over and above wages?

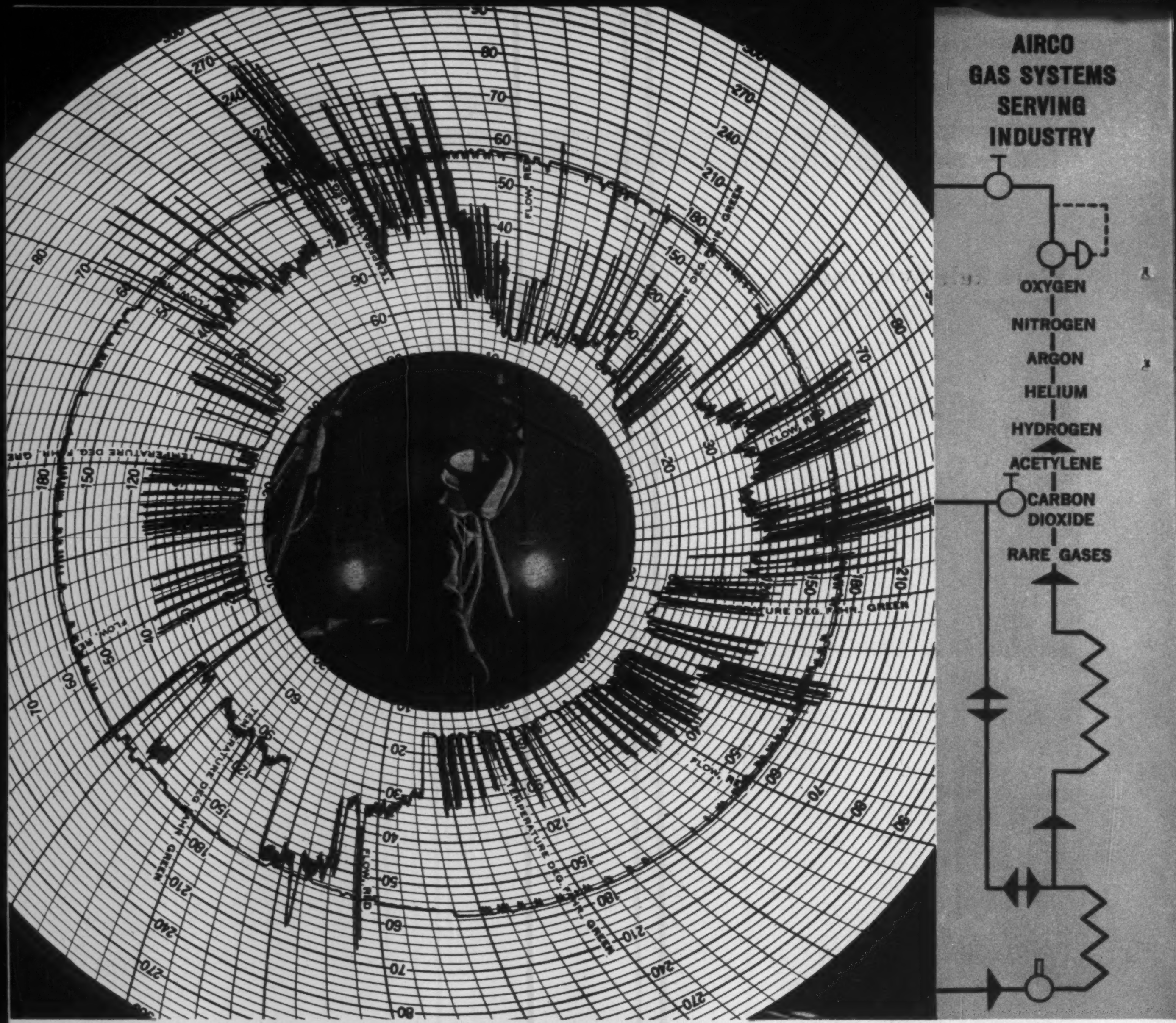
Associated Industries of Cleveland, a non-profit, industrial relations organization serving more than 600 member companies in the Cleveland area, pictures him like this:

A typical Cleveland hourly paid manufacturing employee receives:

1) **$2.56 per hour average straight time pay.**
2) **Seven paid holidays per year.**
3) **$2,000 group life insurance coverage.**
4) **Sickness and accident insurance coverage of $30 for at least 13 weeks.**
5) **Hospitalization coverage for himself and his dependents.**
6) **Surgical benefits for himself and his dependents with a maximum of $200.**
7) **One week's vacation after one year's service. Two weeks' vacation after five years' service. Three weeks' vacation after 15 years' service.**
8) **A rest period of 10 minutes in the morning and/or afternoon.**
9) **Paid by check, weekly each Friday.**
10) **Granted personal clean-up time of at least five minutes at the end of his shift.**

This portrait is based on records of 250 AIC member companies. Their combined payrolls cover more than 90,686 employees, or more than 25 pct of the total manufacturing workforce of Cleveland.

Note: In items 3 through 6, about one out of every three employees share the expense of each item.



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By R. W. Crosby

★Congressional Box Score

A final look at what happened in the pre-election session of Congress is important to industry. Especially since the unsuccessful legislation will be back next year. Here's what happened to major bills of particular interest to businessmen:

Minimum Wage—Nothing. Legislation to raise the $1-an-hour floor and broaden it to cover additional workers died when negotiators failed to compromise differing Senate and House versions.

Federal Aid for School Construction—Nothing. The House Rules Committee refused to permit negotiations to reconcile differing bills passed by the House and Senate.

Housing—A stop-gap bill passed. It keeps FHA insurance on loans for home improvements from expiring and provides additional federal loans for college housing, water and sewage works, and other community facilities.

Defense—Congress voted $41.5 billion for defense. But despite promises to increase it, nothing new was added in the rump session.

Excise Taxes—Legislators granted an extension of existing excise levies and corporation income taxes at current levels for another year.

Foreign Aid—Congress restored at the eleventh-hour $65 million of the more than $500 million it cut from funds requested by the President for the foreign aid program. Ike had appealed for a bigger restoration. Total foreign aid was $3.7 billion.

Tax Relief for Overseas Operations—Conferees agreed on compromise legislation that would reduce income taxes on some of the American companies which are operating abroad in more than one foreign country. A broad bill to allow businessmen to defer tax payments until the money is returned to the U. S. was shelved.

Kickback Penalties

Penalties for kickbacks from subcontractors to prime contractors have been extended to all negotiated government contracts. The previous kickback ban outlawed the granting of gifts by sub-contractors under cost-plus-fixed-fee government contracts only.

President Eisenhower signed the new ban into law last week. Under the new law, any person who either gives or receives kickbacks on negotiated government contracts will be liable to a fine up to $10,000 or imprisonment for not more than two years or both.

Small Business Waits for 1961

Small business may get some relief from foreign competition through legislation next year. It got none this year.

Legislation is expected in these areas: Government to industries hurt by low tariffs set up to help American foreign policy, market research for small business, preferential loan, and depreciation reform.

Agency Reform

Backing for reform of government regulatory agencies is snowballing. Democrats now pledge cooperation with President Eisenhower to reshape agencies.

Sen. Warren G. Magnuson, D., Wash., chairman of the Senate Interstate Commerce Committee, said he would work with the Administration to cut "red tape, delay and costs" in the agencies.

Magnuson said he was "seriously concerned with the cumbersome procedures, unnecessary expenses, apparent delays and regulatory lag" in their administrative methods.

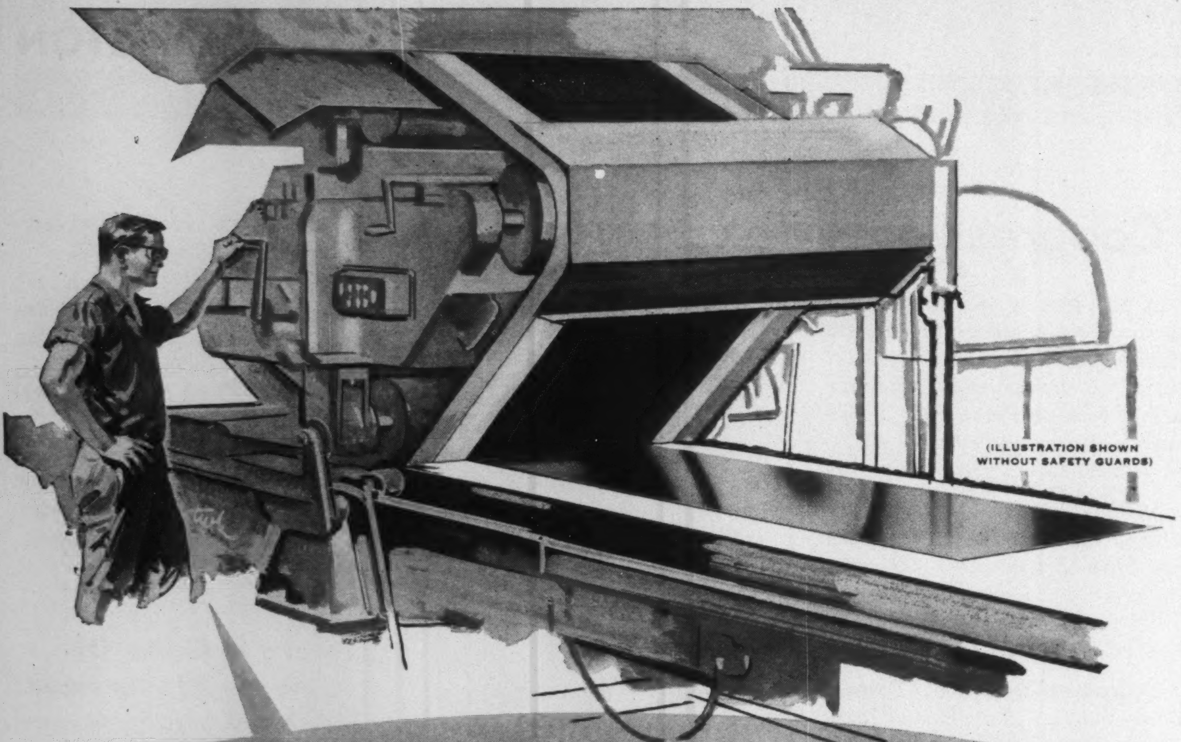
More to Come On Defense Procurement

The Armed Services committees of the two houses of Congress are divided on the Pentagon's handling of defense contracts.

The Senate committee, in the face of continued criticism of defense procurement procedures, declined to recommend legislation restricting military contracting. But the House committee recommended procurement restrictions violently opposed by the Defense Dept.

PENTAGON: Criticized

With several congressmen promising to introduce bills in opposition to Pentagon buying procedures, defense procurement should cause a stir in the 87th Congress.



(ILLUSTRATION SHOWN WITHOUT SAFETY GUARDS)

ASK YOUR POLISHER ABOUT THE DIFFERENCE IN STAINLESS SHEET

ALLEGHENY LUDLUM SHEET sets the standard for surface quality. Polishers will tell you—they handle all kinds and they should know. They want stainless sheet without flaws, a smooth surface ready to take further polishing to meet specs.

For stainless sheet delivered to the polisher with an irregular surface, or containing flaws, needs extra work that takes time and adds to cost—even causes loss of thickness.

That's why the polishers prefer to work with A-L stainless sheet. For A-L stainless sheet is always smooth . . . a surface without flaws . . . quality stainless, order after order. Your polishing department will also give an enthusiastic reception to stainless sheet from Allegheny Ludlum. Polishers think more of A-L stainless sheet—they will think more of you for ordering it for them. Remember, the pay-off is in the polishing.

For consistent temper, tolerances, and finish in flat rolled stainless products, call your Allegheny Ludlum salesman, or write: *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania. Address Dept. A-9-2.*

ALLEGHENY LUDLUM

EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT

2118

U. S. Faces Bloc In Tariff Talks

Trade Relations Council of the U. S., a high tariff advocate, reports the U. S. is facing bloc bargaining at the current sessions of the General Agreement on Tariffs and Trade in Geneva.

It points out that, according to the terms of the agreement forming the European Common Market, the common tariffs of the Common Market will be higher than the current tariffs of some of the members.

For instance, the proposed tariff for shipping barbed wire to any of the Common Market countries will be 15 pct of its value. But, currently, W. Germany is only charging 7 pct and the Benelux countries 8 pct.

U. S. autos will be tariffed at 25 to 29 pct. But now W. Germany charges only 16 pct, and Benelux 24 pct.

Further, says TRC, U. S. tariffs on most items are now lower, so that any even drop of tariffs on both sides would still leave the U. S. on the short end.

For instance, says TRC U. S. tariffs on autos are now only 8½ pct, and on barbed wire there is no tariff.

Ford May Manufacture New Car Overseas

Ford Motor Co. may start building at least part of a new, small car overseas. But this production is not expected to start this year or in 1961.

If Ford does come out with a new small car comparable to small foreign models, there is a good possibility that much of the production work will be done in West Germany. This has caused a flood of protests by the United Auto Workers.

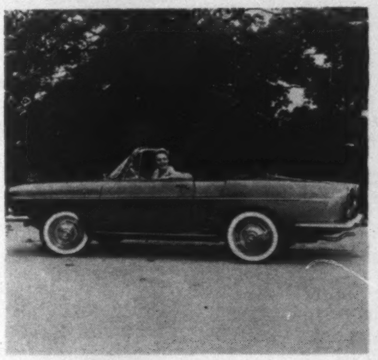
Ford is reportedly planning a new small car to be called the Cardinal, the likely candidate for foreign manufacture.

Ford has already announced that it will spend $1 million dollars in Britain for parts for the 1961 Falcon.

French Automakers Have Cleanup Problem

Overproduction in the French auto industry has forced the Renault Co. to cut working hours for half its working force from 48 to 45 hours per week.

Exports of French cars have slumped, especially in the trans-Atlantic markets. In Renault's case, sales of the Dauphine have dropped because of the success of American compact cars. French automakers are asking for a tax cut on gasoline to stimulate home market sales.



RENAULT: Production drops.

Meanwhile, Mercedes Benz has gone into the British truck market with a heavy model and a light van.

At the moment, British manufacturers are not worried. They are now having their best sales year since 1956.

However, British passenger car production has fallen off. The reason: Drop in exports.

Steel Mills Planned In Greece, Pakistan

World steel production will get a far-flung boost if current plans for the establishment of steelmaking facilities in Greece and Pakistan materialize.

Greek plans call for annual production to reach 250,000 tons. Iron ore, found on the islands of Thasos, Seriphos and Crete and having an iron content of 50 pct, will be used.

Main difficulty in the project is that Greek brown coal is not suitable for coke blast furnaces. Experiments are being carried out to determine whether suitable coke can be produced for use in electric, low—shaft furnaces.

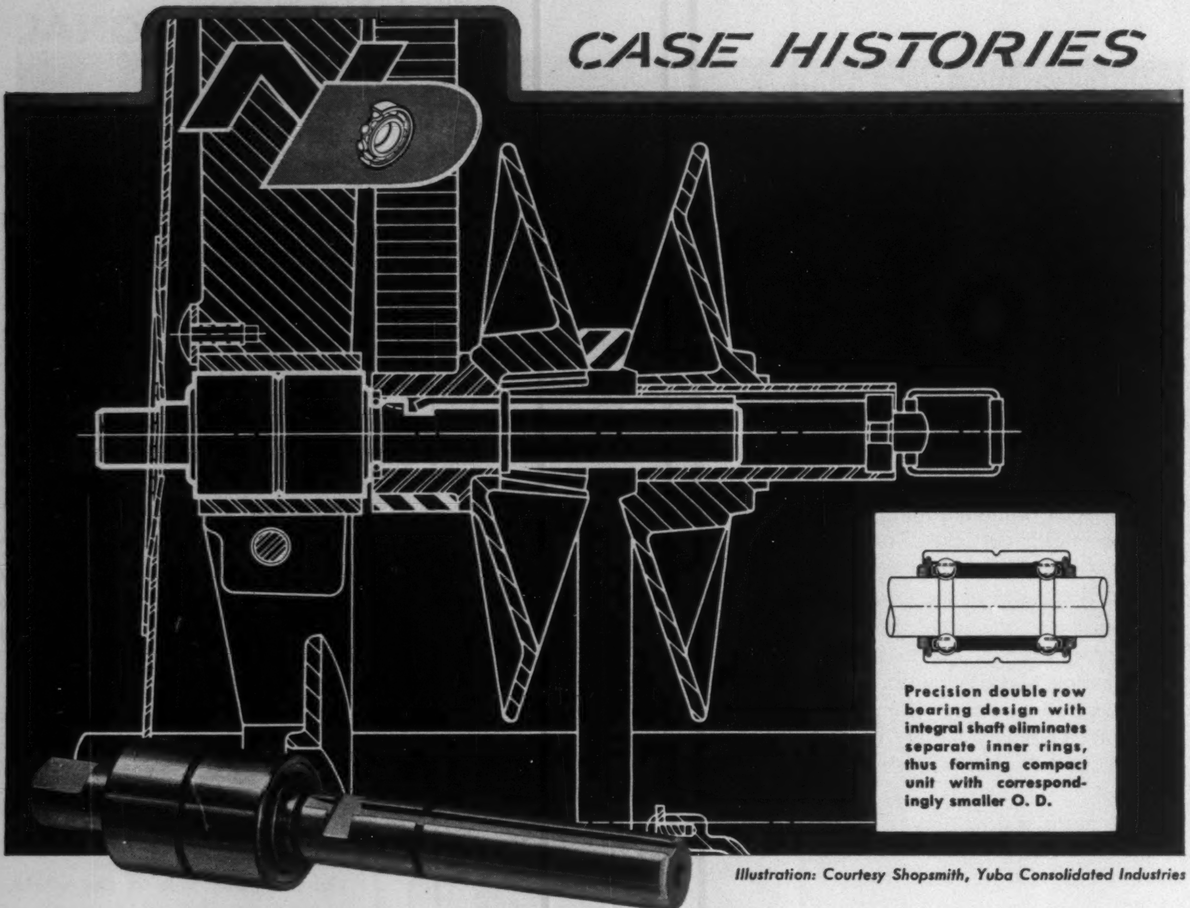
Russia has offered coke at a favorable price, but the Greeks believe this is being done for purely political reasons.

On the other side of the world, establishment of two steel plants, one each in East and West Pakistan, now seems to be in sight. Koppers Co., Inc., Pittsburgh, has submitted its feasibility report on the 250,000-ton plant for Karachi. Also, a Japanese team of experts has completed its report for the 100,000-ton plant at Chittagong (East Pakistan).

Britain's Production Levels Off

The rise in Britain's industrial output has stopped. However, this is more of a leveling off and does not indicate that business there is falling off.

During July factories turned out the same production totals as in the three preceding months. Falling exports and the cut in consumer durables such as cars, washing machines, and refrigerators are slowing production.



Precision double row bearing design with integral shaft eliminates separate inner rings, thus forming compact unit with correspondingly smaller O. D.

Illustration: Courtesy Shopsmith, Yuba Consolidated Industries

N/D Bearing Solves Home Power Tool Speed Changing Problem!

CUSTOMER PROBLEM:

Require low cost, compact idler shaft assembly for speed changer in popular, multi-purpose home power tool. The assembly must mount on ball bearings . . . operate at speeds up to 6000 RPM.

SOLUTION:

N/D Sales Engineer, cooperating with customer engineers, recommended a *single* N/D ball bearing —a compact integral shaft unit designed as part of idler assembly. The unit permits one of two interlocking variable pitch pulley halves to slide axially on shaft when changing pitch at high speed. This precision, automotive type fan and water pump bearing eliminates extra parts inventory and shaft machining . . . reduces assembly time. In addition to solving complex design problem, N/D's compact heavy-duty ball bearing is integrally sealed for protection against saw-generated dust . . . and lubricated-for-life for added end user sales appeal!

If *you're* designing new equipment, why not call your New Departure Sales Engineer. He probably can help engineer your application with a standard, volume-produced N/D ball bearing that will help solve your bearing problem. For more information contact New Departure Division, General Motors Corporation, Bristol, Connecticut.

Replacement ball bearings available through United Motors System and its Authorized Bearing Distributors.

NEW DEPARTURE

BALL BEARINGS

proved reliability you can build around

Studies Machinability

A new columbium alloy—F-48—is being welded and machined under a study program for the Air Force. Ling-Temco Electronics, Inc. is heading up a study which involves fabrication and testing of a structural component under simulated re-entry environments. Columbium may be one of the heat-resistant metals sought for higher "mach" number flight. It retains usable structural properties at 2500°F.

Press Handles 12 Stations

Watch press-transfer-feeding devices. New variable size models enable the transfer to accept different part sizes. One unit can feed 12 different parts, of widely varying size, to different dies in a single press. The effect is to create 12 separate stations within a single unit.

Titanium Takes on Color

A unique process coats titanium in brilliant and uniform colors without the use of harmful dyes or paints. Multi-colors can also be applied to a single part. The coloring process features two basic benefits. One is resistance to chemical corrosion while the other permits the titanium to remain color-fast at 600°F and legible after extended exposure to 1000°F.

Coatings Boost Toughness

Tough, armor-like coatings, with applications ranging from auto bumpers to sensitive tapes, have been developed from a new family of polyester resins. The new Vitel resins offer exceptional resistance to abrasion, ultra-violet rays, chemicals and weather. Other advantages include excellent adhesion, clarity, electrical properties and the ability to bind pigment.

Ready-Painted Aluminum

A new processing line paints both sides of aluminum strip—in a single pass. It can even apply different colors to each surface. Without damaging the finish, the ready-painted stock can be sheared, slit, formed and pierced. The new line handles strip widths up to 66 in. It operates at speeds up to 100 fpm. A stitcher, within the line, splices strip lengths. Thus, the endless strip is coated in an unbroken pattern. After processing, stitched sections are automatically removed.

Body Gets Closer Check

Ultrasonics is used by Chrysler Corp. to detect welding quality in unitized body construction. Troubles in the past were related to incomplete fusion. Now, however, ultrasonic vibrations send back a true picture of the weld quality. In the case of spot welds ultrasonic vibrations continue without hindrance if the weld is acceptable. If not, vibrations stop at the defective weld and echo back the report.

Spacecraft Protected

A weight reduction of more than 50 pct in the outer walls of spacecraft can be achieved with the use of meteoroid bumpers or multi-wall construction. General Electric's Missile and Space Vehicle Department found in tests that bumpers would dissipate a large part of the kinetic energy of incoming meteoroids and result in only mild pitting of a vehicle's skin. Protection against meteoroids is a major criteria in the design of spacecraft.

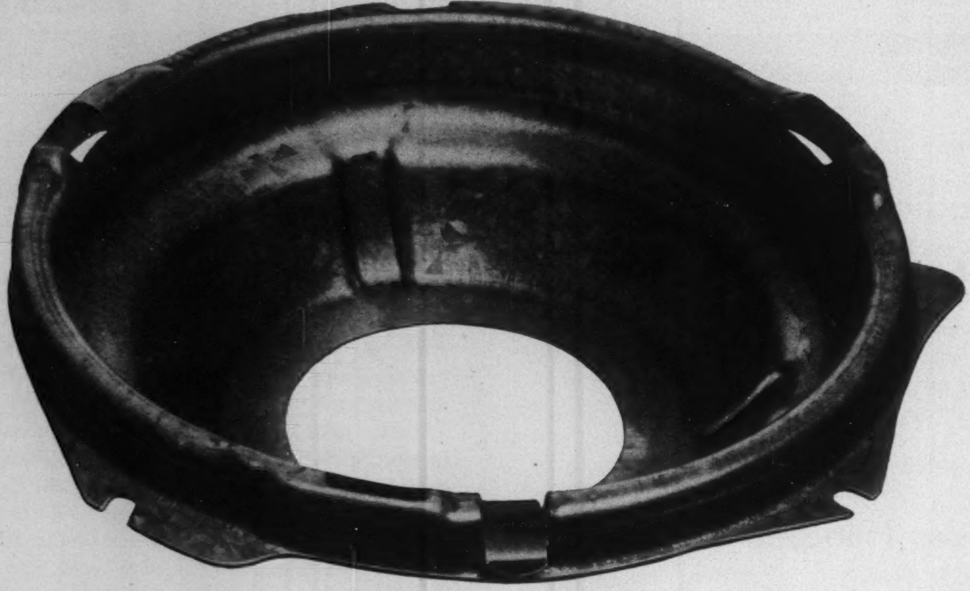
Stops Pickling Tank Leaks

Pickling tank leaks can now be repaired quickly and economically without draining off the pickling liquor. The process makes use of a new neoprene troweling compound which is pumped directly through the opening in the steel tank. The neoprene courses through the leak and cures, to form a plug, closing the leak quickly and effectively.

Protects Against Corrosion

A new corrosion preventative that can withstand four or five ICBM firings is now available. Developed by the Department of Defense to coat launching pad equipment, the material will retain its rust preventative action despite the high-heat level generated by the rocket engines. At the opposite end of the scale, another corrosion preventative designed originally for rocketry can hold up under temperatures as low as –350°F.

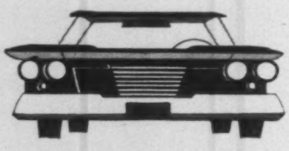
Better products through better methods and steels



How zinc-coated steel cut 5 steps from automotive lamp housing fabrication.

When automotive head and tail lamp housings were drawn from cold rolled sheet steel and then zinc-plated or painted, as many as five or six handling and cleaning steps were required to make them corrosion-resistant.

Now, fabricated from Weirkote continuous-process zinc-coated steel, the housings go directly from the press to the assembly line. Further processing is unnecessary because Weirkote can be worked to the limits of the steel itself without chipping or flaking its corrosion-resistant zinc surface.



It's this superiority that caused the automobile industry to increase its consumption of zinc-coated steel more than 700% in five years; to use it in such varied applications as mufflers, window channels and the understructures of unitized bodies; to take advantage of developments such as differentially zinc-coated steel that can be welded at top production-line speeds.

A major supplier is Weirton Steel Company—producer of Weirkote continuous-process zinc-coated steel sheets and many other excellent steels that are improving products, methods and profits throughout industry.

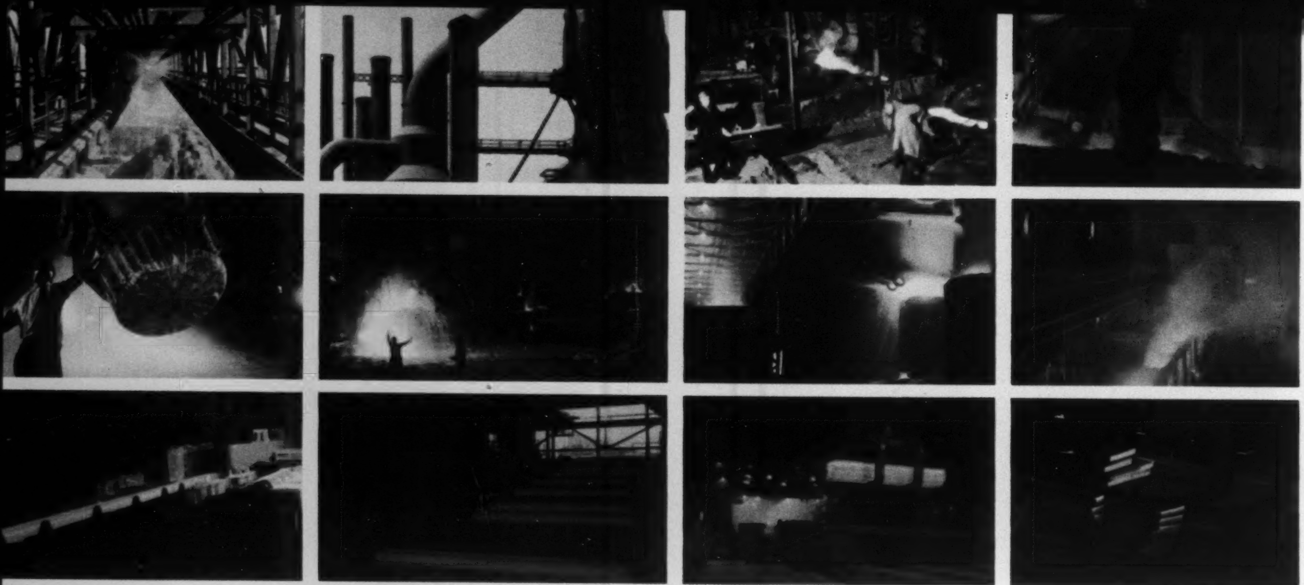
Look for the STEELMARK on the products you buy; place it on the products you sell.

WEIRTON STEEL
Weirton, West Virginia

Weirton Steel is a division of **NATIONAL STEEL CORPORATION**

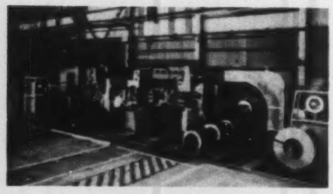
Weirkote will also be available in 1961 from National's Midwest Steel Division, Portage, Indiana.

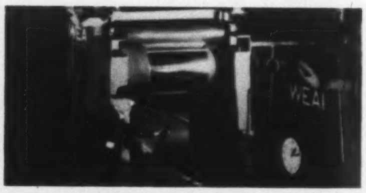
What's ahead for the Steel Industry?

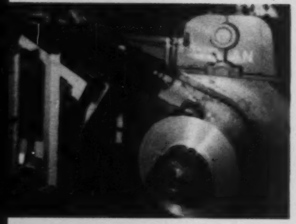


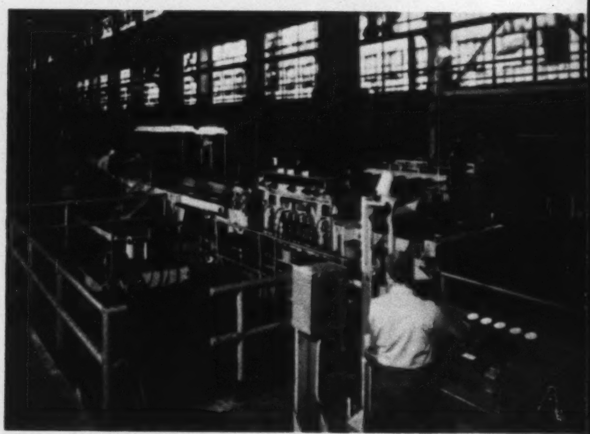
A decade of growth,

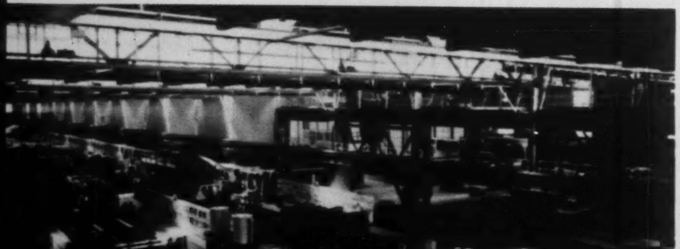
but with greater challenges to be met

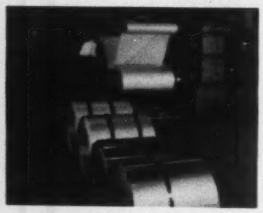


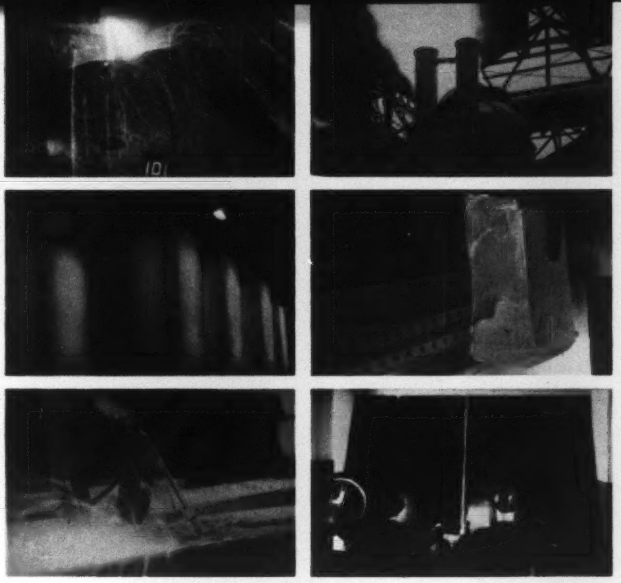












by each Steel Producer

THE steel industry traditionally has been able to solve most of its problems by growth. And the saga of this growth, both in tonnage and versatility of our mills, is an impressive one. Never before has steel been so important to our nation. And with soaring population, a steadily climbing standard of living, and exciting new products on the horizon, the further expansion of the steel industry is assured.

But the next decade poses challenging problems with this promise of growth: increased competition, shifting markets and the changing nature of steel demand are all problems for which each producer must find his own, best answer.

Cost reduction is one area that must be given very close attention. In some cases, expanding production will help "dilute" costs; in others, true reduction of costs by automation of present equipment and technological improvements is the answer.

Modernization will be a prime objective for many firms. Old equipment will be replaced by high speed, high production units which will greatly increase efficiency.

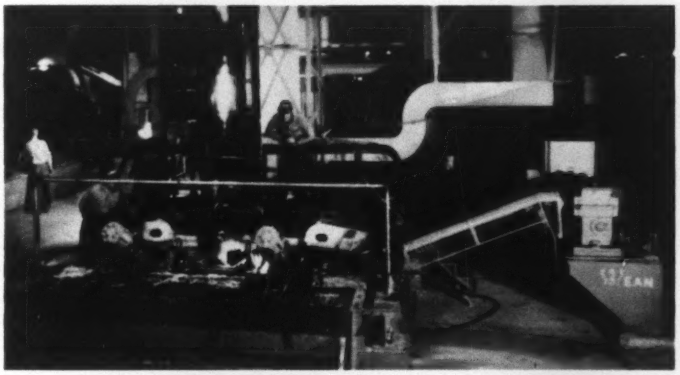
Planned distribution will continue to be a major factor in the development of new facilities. Every expansion program will have to be plotted with regard to market areas and transportation of raw materials and finished products. The Seaway project and the recent development of rail-highway transportation are examples of new opportunities in this area.

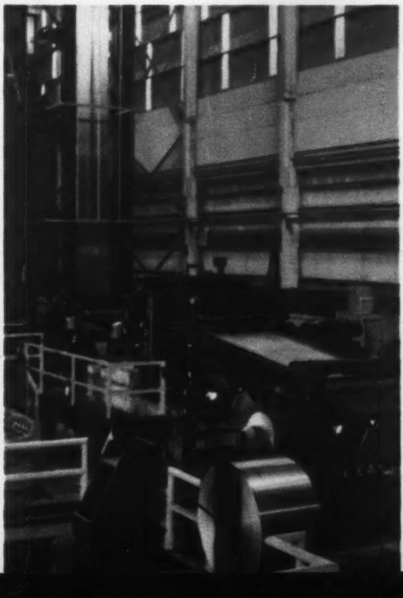
Customer service has already reached a remarkable stage of development in metallurgical liaison, but even greater strides are indicated for the future. Steel firms must help the customer get the improved materials he needs, when he needs them, and at a competitive price.

Quality control will be given even greater emphasis than ever before in order to assure customers of uniform quality materials in the competitive days ahead. Closer control will reduce scrap losses in production, too.

New markets will be tapped by some firms as they diversify their output through addition of new finishing facilities. New products, too, will open new markets for steel: vinyl-clad strip and "thin" tin plate, recently emerged from the research laboratory, are typical.

Wean Engineering has dedicated its resources and abilities to one field: the design and construction of sheet, strip and tin plate processing lines for steel producers. In this specialization, we have been privileged to work with all the major steel companies over the 31 years of our history.





2179 Years of Strip Processing Knowledge

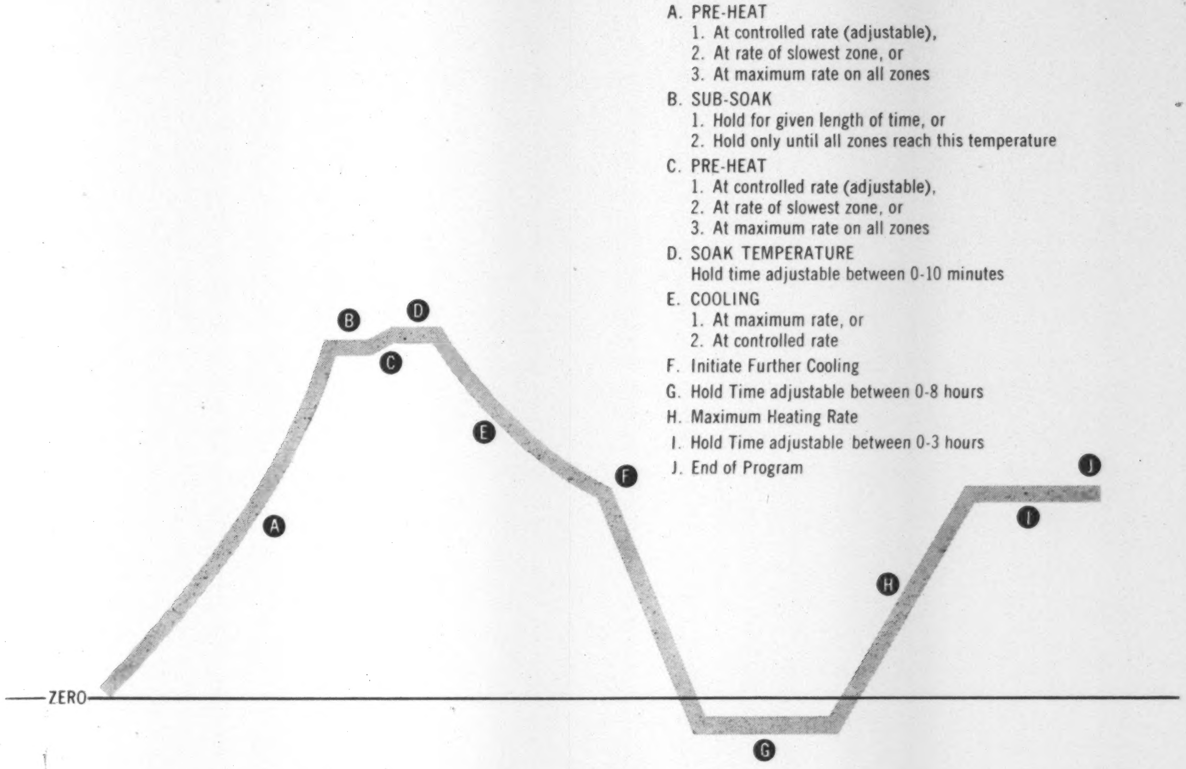
The cumulative experience of Wean's personnel represents a good many lifetimes devoted to one field: continuous strip processing line design and manufacture. The "creative engineering" abilities of our staff have given the steel industry more efficient and productive processing lines for tinning, galvanizing, annealing, pickling, cleaning, coil preparation, shearing and slitting.

Today, as ever, we look forward to a continuation of the working partnership where our experience and capabilities can help the steel industry meet the challenges of the Sixties.

THE WEAN ENGINEERING COMPANY, INC. · WARREN, OHIO

Associate Companies: Wean Manufacturing Company, Warren, Ohio • Wean Equipment Corporation, Cleveland, Ohio
Wean-Damiron, S.A., Paris, France • Wean-Miles, Ltd., London, England • McKay Machine Company, Youngstown, Ohio
Wean Engineering Company of Canada, Ltd., Hamilton, Ontario

Litho in U.S.A.



A. PRE-HEAT
  1. At controlled rate (adjustable),
  2. At rate of slowest zone, or
  3. At maximum rate on all zones
B. SUB-SOAK
  1. Hold for given length of time, or
  2. Hold only until all zones reach this temperature
C. PRE-HEAT
  1. At controlled rate (adjustable),
  2. At rate of slowest zone, or
  3. At maximum rate on all zones
D. SOAK TEMPERATURE
  Hold time adjustable between 0-10 minutes
E. COOLING
  1. At maximum rate, or
  2. At controlled rate
F. Initiate Further Cooling
G. Hold Time adjustable between 0-8 hours
H. Maximum Heating Rate
I. Hold Time adjustable between 0-3 hours
J. End of Program

When temperature uniformity is a must... reproduce your heat-treating cycles with L&N's new master-slave program control

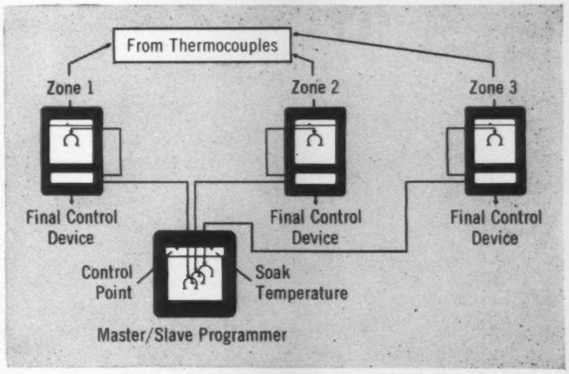
Designed for applications where temperature uniformity is of prime importance, L&N's new master-slave program control system has the flexibility to take your product—with minimum temperature gradient—through various heating and cooling cycles. It is currently being used in brazing stainless steel honeycomb panels for supersonic aircraft and missiles.

You can use this system on either batch or continuous furnaces . . . can control from either work or furnace temperatures. Heating cycles may be at a fixed rate, or at the rate determined by the slowest or fastest heating zone. As many as twenty-four zones may be automatically controlled by one master-slave programmer.

This master-slave system is available with 3-action P.A.T. control for fuel-fired furnaces; with 3-action C.A.T. control for continuous, stepless regulation of input to electric heaters or blankets; or with D.A.T. control for either electric or fuel-fired furnaces.

The system includes Speedomax® H controllers with appropriate couples and control devices for each zone; and a master-slave programmer for automatically and continuously adjusting control-point for each zone.

If your process can benefit from precisely controlled heating and cooling, you may be surprised to learn how large a return you can get by modernizing with this quality instrumentation. For details, call your nearest L&N office, or write us at 4956 Stenton Ave., Phila. 44, Pa. Ask for Process Data Sheet 660(2).



LEEDS NORTHRUP
Instruments
Automatic Controls • Furnaces

Pioneers in Precision

Much of the beauty of Chrysler cars

The proper foundation of a Chrysler-style paint job shows itself in this gleaming Plymouth "body-in-white"—steel with the surface finish a truly fine car must have.

Body parts for Chrysler cars emerge from a complex of huge presses and coils and sheets of flat rolled steel. Floor pans are formed, to be wed further on into single unitized assemblies of 50 major parts by fully-automated resistance welders. Doors are stamped with great precision, and 100 ton presses squeeze out car roofs, without a break or blemish.

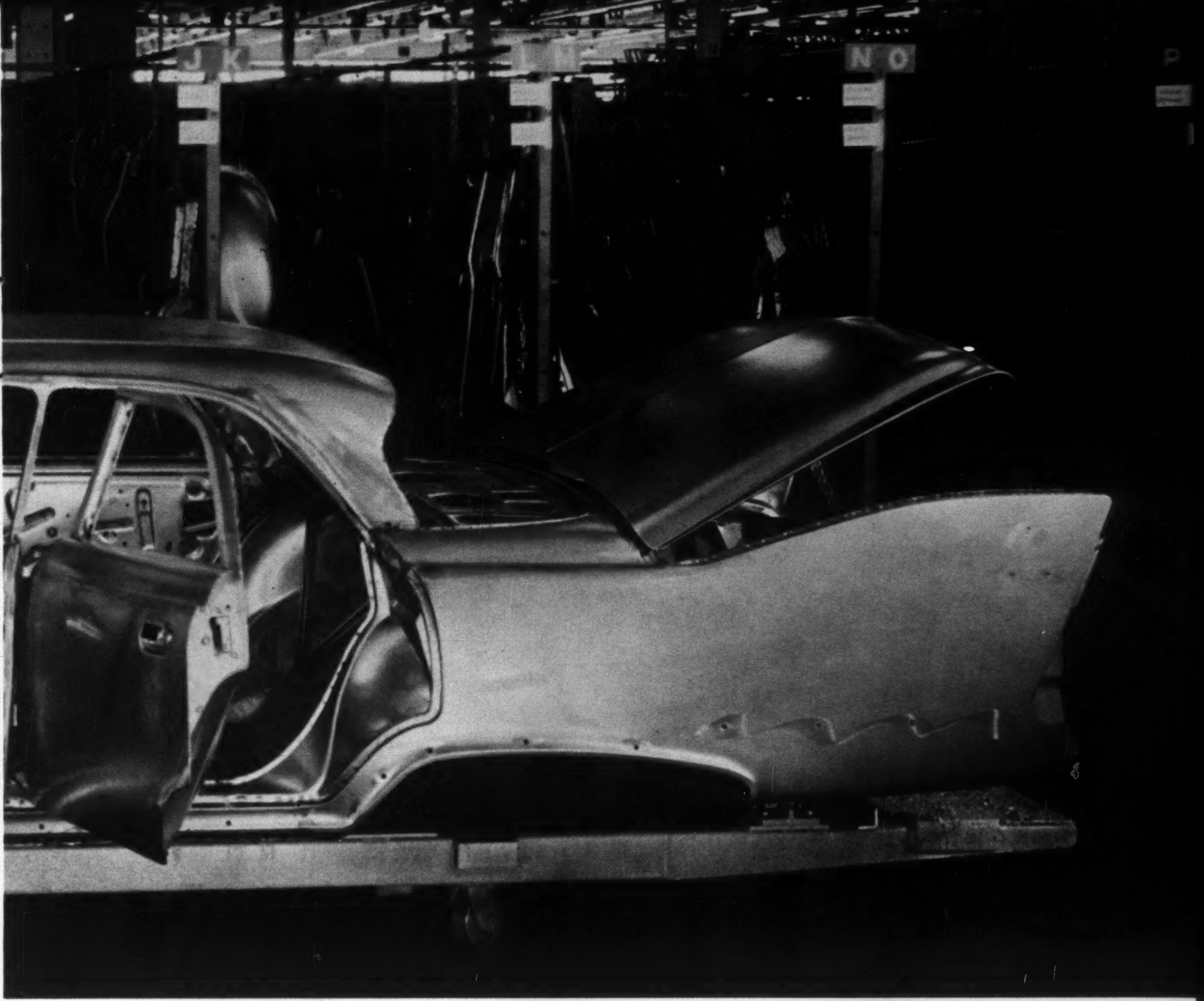
This is Chrysler Corporation's Ohio Stamping Plant, giant of the auto industry, where 28 major stamping lines eat 2000 tons of steel a day and produce 600 different body parts. Steel is the basic raw material of this amazing plant—and the men who buy and use it know exactly what they need. As a regular supplier, J&L matches their needs *consistently*.

J L STEEL

Jones & Laughlin Steel Corporation

3 GATEWAY CENTER, PITTSBURGH 30, PA.

Steel



Feast your eyes on over 1000 lbs. of unadorned steel! Notice how the steel itself contributes to the elegance and grace of Chrysler styling—how, even in this raw metal stage, the "body-in-white" has a lustrous finish of real beauty.

comes from the steel itself

Each die-forming situation is individual and demands a specific set of metallurgical properties from the steel. In many cases, the factor of extreme importance is surface finish of the steel. Other times, drawing quality is paramount. And often, *combinations* of these and other qualities are needed, balanced one against the other with metallurgical precision.

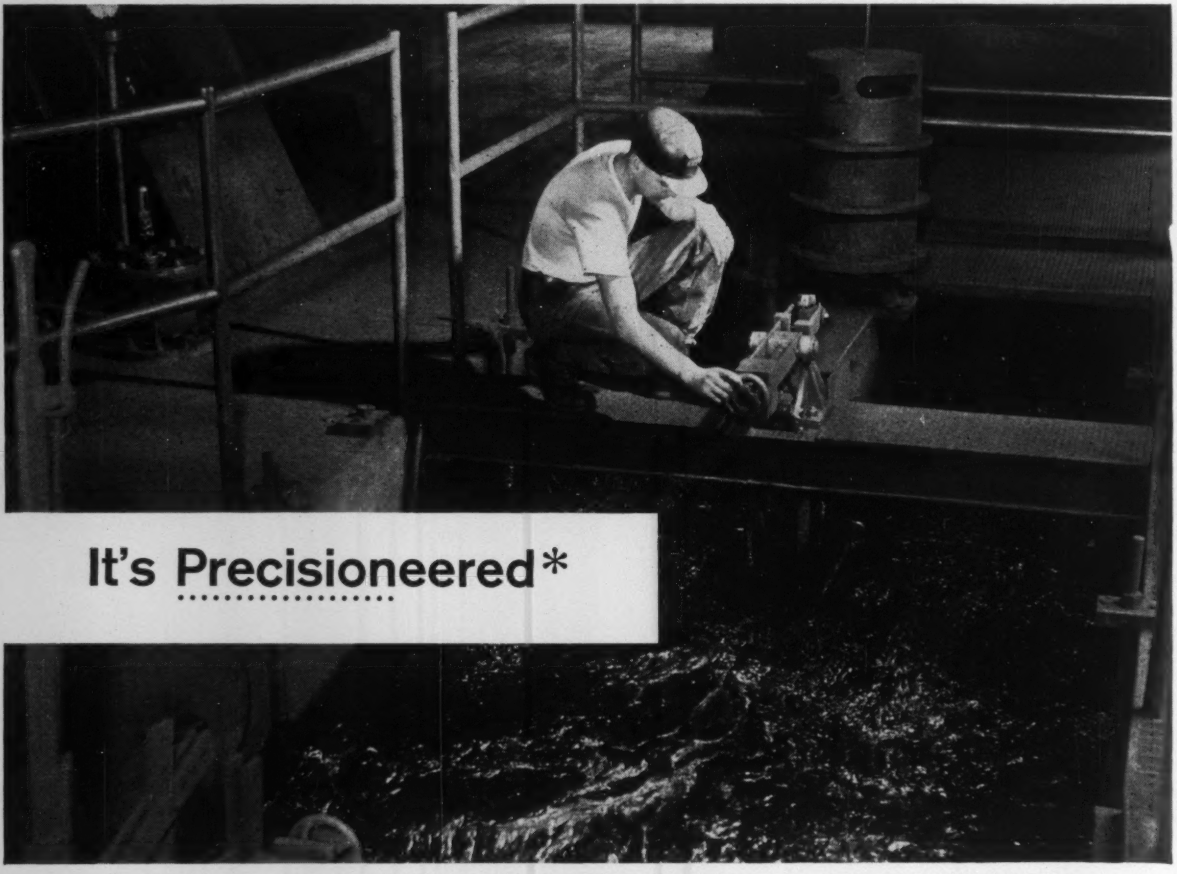
The Ohio Stamping Plant may be big. But it is a tight operation—efficient, competitive, economical, with full control of quality at all times to insure the beauty and soundness of Chrysler bodies. That J&L steel is bought regularly, and used at one time or another in all the major parts produced by the Ohio Stamping Plant, speaks well indeed for J&L quality.

This is the roof line—at full rate of production. J&L is one of only three suppliers who can provide the 80-inch, 0.038-gage coils Chrysler needs here. Breaks and strain lines cannot be tolerated on roofs, so drawing quality is vital—as is surface finish, for reasons of appearance.

◄

This Steelmark identifies products made of steel. Look for it when you buy.

What's the reason? Why can Island Creek coal lower the cost per 1000 pounds of steam?...



It's Precisioneered*

Huge wash boxes remove impurities from coal by stratifying solid particles in up and down pulsations of water.

* Everything that happens to a Precisioneered Coal at Island Creek is designed to make it do its job most efficiently, at the lowest possible cost. It starts at the mine face—with superior seams of eastern coal. It continues through the modern preparation plants where precision engineering techniques and strictest laboratory controls assure a product that will produce steam—in your equipment—at the lowest net cost per 1000 lbs. We'd welcome a chance to discuss the far-reaching engineering service and evaluation studies that are also part of Island Creek Precisioneering—and which can forecast in advance what can be done to lower net costs. Write. Or phone. No obligation, of course.

P.S. TO COKING COAL BUYERS
Island Creek Precisioneered Coking Coals can help you produce more hot metal per square foot of hearth area.

ISLAND CREEK
Precisioneered Coal

You can depend on Island Creek . . . a career company dedicated to coal

Island Creek Coal Sales Company, Chafin Building, Huntington 18, West Virginia . Chicago . Cincinnati . Cleveland . Detroit . Greensboro . New York . Pittsburgh

LETTERS FROM READERS

A Memory

Sir—In the July 14 issue of The IRON AGE I read your most wonderful editorial "Our Next President: Lord Have Mercy on Him," and since then I have been unable to forget it. Then, in the letters from readers, Aug. 11 issue, I saw where a Mr. W. C. Laycock of Ft. Wayne, Ind., asked permission to reproduce your article and said it appeared in their local newspapers with favorable comment.

I, too, would like to have your permission to send your editorial to our daily paper, "The Telegraph-Herald" to see if they will print it for me. In a few well-said words you have emphasized what a tremendous job our President has, and especially what the next one will have to face. May God have mercy on him, and on us, if we do not choose wisely.

So, may I have your permission to try to have your wonderful and sincere editorial reprinted? — Mrs. Marion G. Reisner, The Adams Co., Dubuque, Ia.

- **Permission granted.—Ed.**

Splendid

Sir—If it is available, will you please send me a reprint of the splendid "Directory of Tool Steels and Carbides" which appeared in your August 11, 1960, issue.—H. Edward Cable, Weld Tooling Corp., Pittsburgh, Pa.

- **The copy has been mailed.—Ed.**

Wrong, Interesting

Sir—In your Aug. 18 issue you printed a Techfront item about new polyurethane formulations under the heading "Resin Takes Liquid Form." The copy incorrectly identified Dr. Rene Kales, the discoverer of these formulations, with Martial & Co., Inc. Dr. Kales is the research director of Delka Research Corp., a Martial & Co. client.

This error has, as a matter of fact, had an interesting side effect: the number of inquiries that we have received directly about the new discovery as a result of the story's appearance in your magazine are wonderful proof of your alert and lively readership.—Judith Gaylor, Martial & Co., Inc., New York, N. Y.

From Newsfront

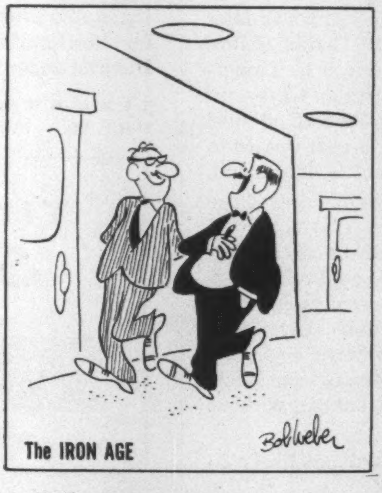
Sir—In a recent IRON AGE Newsfront, you had a paragraph concerning high-strength wire. Could you please advise me as to the name of the company manufacturing such wire?—K. Hellinger, Rochester Ropes, Inc., Culpeper, Va.

- **Contact the National Standard Co., Niles, Mich.—Ed.**

Enjoyed

Sir—I very much enjoyed the article "Are Hydrogen Ions the Culprits That Cause Metal Corrosion?" It appeared in your August 4 issue. If possible, would you please send me one reprint. — G. W. Haaff, Link-Belt Co., Indianapolis, Ind.

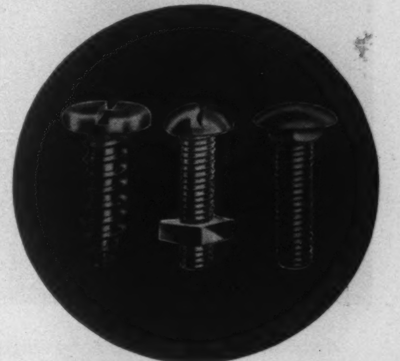
- **The reprint has been sent.—Ed.**



"I finally got rid of my headache. He quit this morning."

LIBER
FOR SUP
SAVING
TRUST
1943

STANDARDIZE 100%
ON SOUTHERN
FASTENERS



Today more cost-conscious management men are taking a new hard look at quality fasteners as a partial solution to production problems. These men know that faulty fasteners often take a big toll in profits because of rejects, downtime, waste or spoilage. Likewise, they know that quality fasteners help insure more profitable operations through elimination of needless production hazards.

It's good sense to standardize 100% on Southern fasteners for production *and* for profit. Southern specializes in standard fasteners for industry. All are USA-made in our own plant.

For super savings all along the line—*your* production line! — standardize 100% on Southern fasteners. Ask your nearest Southern distributor for your free copy of our new chart BP-2 describing Southern's new industry-approved bulk package and palletizing system, or write Southern Screw Company, P. O. Box 1360, Statesville, N. C.

**Manufacturing and Main Stock
in Statesville, North Carolina**

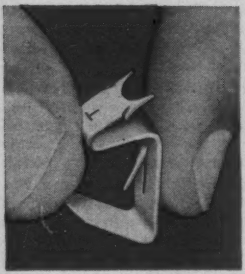
WAREHOUSES:
New York • Chicago • Dallas • Los Angeles

Machine Screws & Nuts • Tapping Screws • Stove Bolts • Drive Screws • Carriage Bolts • Continuous Threaded Studs • Wood Screws

Southern
SCREW COMPANY
STATESVILLE • NORTH CAROLINA

Another SPEED NUT Savings Story . . .

62% cost reduction made with **SPEED CLIPS®** on Cramer Posture Chairs



A dozen Speed Clips now do the job of fastening upholstery to the steel seat of Cramer Posture Chairs. Before the switch to Tinnerman Speed Clips, an expensive formed-steel rim was spot-welded to the seat to do this job.

Speed Clips save Cramer at least 46 cents—or 62% of fastening cost—on each chair . . . they eliminate the rim-forming and spot-welding operations . . . permit faster, easier assembly . . . simplify disassembly if the chair ever needs re-upholstering. Working jointly with Cramer's engineering staff, Tinnerman fastening specialists were able to provide all these advantages without sacrificing product quality.

Assembly costs on your product are likely to benefit greatly, too, if you'll enlist the aid of this Tinnerman team. You can arrange for a free Fastening Analysis of your product simply by calling in your nearby Tinnerman representative. You'll find him listed in the "Yellow Pages" and in Sweet's PD File under "Fasteners." Or write direct to:

TINNERMAN PRODUCTS, INC.
Dept. 12 • P. O. Box 6688 • Cleveland 1, Ohio

TINNERMAN
Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

FATIGUE CRACKS

Big Changes

The steel industry has reinforced some basic changes which were only starting to take hold when the last Iron and Steel Engineers' Exposition was held two years ago.

Automation has become a driving force to lower production costs. New steelmaking processes are gaining wider industry acceptance. Also, the ore supply situation is changing character; the financial picture of the industry is taking on a new look; and foreign steel producers are having an effect on U. S. and world steel markets.

Impact Causes Study — Because of the impact these changes are making on the American steelmaking scene, The IRON AGE studies these problems in depth in this issue. Here is a rundown of the articles you'll find in this AISE feature issue.

Computers in Steelmaking—The drive to lower production costs has caused a revolution in steelmaking, rolling, and finishing processes. The roundup article shows how widespread the use of computers, punched cards and other automatic methods have become in the cutting of production costs.

New Steelmaking Processes — A number of new steelmaking processes designed to increase production and quality, and yet to meet the demands of new steel properties, have sprung up in recent years. This technical survey evaluates these new processes and shows the extent to which they are now used.

Iron Ore Supplies — More iron ore imports are going into U. S. blast furnaces each year. This week, IRON AGE points up the changing nature of iron ore supplies and tells what the supply outlook is for the future.

World Trade—Recent years have seen a steady growth of steel capacity in the United States and abroad. Some foreign countries are becoming "steel plus" nations. A special study outlines the position of American producers in relation to world steel markets.

New Financial Analysis—Along with technological progress and expanded capacity in the industry, the financial performance of some steel companies is taking on a new look. This article suggests some of the factors to be considered in evaluating profit performance.

Handy Rule

Do you have a problem converting metric rule to inches and fractions of inches when imported goods arrive at your plant? We know that it takes up valuable time to convert the figures and often can lead to confusion.

Now, a Pennsylvania company may have a good answer to your conversion problem. T. M. Gibsob & Co., Swarthmore, Pa., has developed a conversion ruler that will figure out measurements with only a slight flick of the wrist.

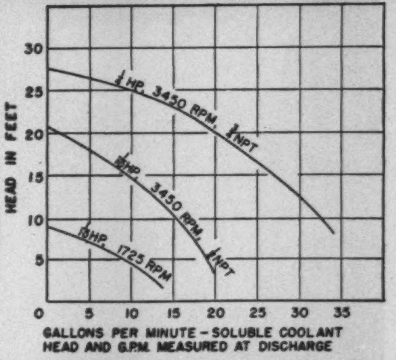
The ruler, made of plastic, carries both metric and linear measures and by turning it in the light will rapidly convert one to the other.

It can be obtained free of charge by writing to the company at Swarthmore, Pa.

REJECT
Bob Weber
The IRON AGE

"Sure, I've heard of work slumps before . . . but seven years?"

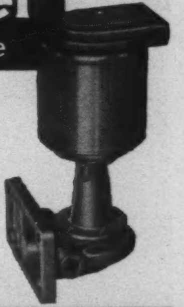
FOR
MORE
COOLANT PUMP
ECONOMY*



*Performance Chart

Gusher
Sealess-Type

Gusher flange mounted coolant pumps feature a simple design with no seals, no packing or priming necessary. They are designed to mount on the side of the reservoirs with either external or internal discharge. Immersed type also available.



Model 5-P

RUMACO
Seal Type

Rumaco pumps are seal type, centrifugal pumps that can be mounted in any convenient place. Precision built, Rumaco pumps give efficient, trouble-free operation. Seals are the best obtainable.

Model 5-S

WRITE FOR FURTHER
INFORMATION TODAY

THE Ruthman
MACHINERY CO.
1809-1823 Reading Rd., Cincinnati 2, Ohio

- COOLANT PUMPS
- CIRCULATORS • AGITATORS
- MOLTEN METAL PUMPS

Molybdenum

workhorse of the metals

industry Molybdenum has found large use as an alloy for steel compositions that are employed in innumerable applications. Nitriding, stainless steels, turbine shafts, gear steels, truck, tractor, automotive carburizing and parts—and so the list grows to hundreds of uses—in there because it is dependable—it delivers the physical properties.

You add molybdenum to some steels because it adds anti-corrosion properties. It reduces temper brittleness, it raises the hardenability, it enhances the shock resistance, it increases the tensile properties—in short, it does most everything.

When a tough steel job is considered, the first thought is how much molybdenum. It gives the metallurgist a comfortable feeling to know he has molybdenum in the specification—and that the supply of it is here—at home.

If you have a problem involving the use of moly, we invite you to come to headquarters for your solution. Expert metallurgists are yours for the asking.

MOLYBDENUM

4 Gateway Center CORPORATION OF AMERICA **Pittsburgh 22, Pa.**

Offices: Pittsburgh, Chicago, Los Angeles, New York, San Francisco
Sales Representatives: Brumley-Donaldson Co., Los Angeles, San Francisco
Subsidiary: Cleveland-Tungsten, Inc., Cleveland
Plants: Washington, Pa., York, Pa.

COMING EXHIBITS

Iron & Steel Show—Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

Metal Show—Oct. 17-21, Convention Hall, Philadelphia. (American Society for Metals, Metals Park, Novelty, O.)

Die Casting Exposition & Congress—Nov. 8-11, Detroit Artillery Armory, Detroit. (The Society of Die Casting Engineers, 19382 James Couzens Highway, Detroit 35.)

MEETINGS

SEPTEMBER

National Foundry Assn.—Annual meeting, Sept. 22-23, Edgewater Beach Hotel, Chicago. Association headquarters, 53 W. Jackson Blvd., Chicago.

Porcelain Enamel Institute, Inc.—Annual meeting, Sept. 25-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington, D. C.

Farm Equipment Institute—Annual convention, Sept. 25-28, The Statler Hilton Hotel, Dallas, Tex. Institute headquarters, 608 S. Dearborn St., Chicago.

American Welding Society — Fall meeting, Sept. 26-30, Pittsburgh. Society headquarters, 33 West 39th St., New York.

OCTOBER

Metal Lath Mfrs. Assn.—Fall meeting, Oct. 6-7, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, Engineers Bldg., Cleveland.

The Electrochemical Society, Inc.—Fall national meeting, Oct. 9-13, Shamrock Hotel, Houston, Tex. Society headquarters, 1860 Broadway, New York.

American Gas Assn.—Annual convention, Oct. 10-12, Atlantic City. Association headquarters, 420 Lexington Ave., New York.

"CALL FOSTER... THEY'LL SHIP PIPE PLUS"

L. B. FOSTER CO.

Right! Whether it's a routine order or an emergency request for unusual or hard-to-get sizes, Foster gives you pipe "*plus*."

You get all your pipe when and where you need it, cut to length or fabricated in complete-package shipments, at lowest possible cost.

For non-pressure applications, check the unusual savings on Foster Structural Pipe. Foster's nationwide warehouses stock Tested & Structural Steel Pipe, 1/8" through 48" in all sizes and walls—"*plus*" Stainless, Seamless, Alloy, Pressure, Aluminum, Wrought Iron, PVC Pipe and Valves, Fittings, Flanges.

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PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
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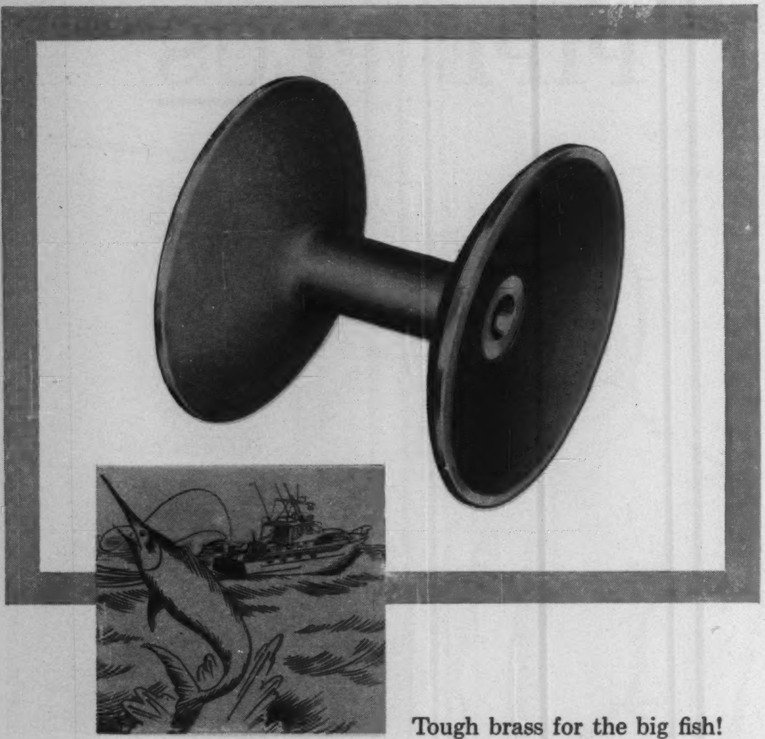
Faster From Foster
PIPE • PILING • RAIL

LOOK what brass is doing now!



Tough brass for the big fish!

Here's a *unique* deep-sea fishing reel spool converted to a Titan brass pressure die-casting. Fishermen found that the previous spool of the reel buckled under convulsive pressure of deep-sea marlin and tuna on modern fishing lines.

Stronger, wear-resistant, corrosion-resistant Titan brass die casting solved the problem. In fact, the higher strength of this die casting allows even thinner, streamlined spool sections. And here's the unique part: It's a spool in *one piece!* . . . all because of Titan brass ingenuity.

Like advantages can be yours when you switch to Titan brass pressure die castings. Let us help design and quote on your component parts.

Call your nearest Titan Man for detailed data and a brass die casting quote, or send your sample and blueprint to Bellefonte, Pa., or Newark, Calif., for fast service.

Send for latest folder on Titan Pressure Die Castings

Write us on your letterhead

Titan® METAL MANUFACTURING CO.
DIVISION OF CERRO DE PASCO CORPORATION
Bellefonte, Pa. Newark, Calif.
OFFICES & AGENCIES IN PRINCIPAL CITIES
45 years of quality brass
®

MEETINGS

Pressed Metal Institute — Annual meeting, Oct. 10-14, Shawnee Inn, Shawnee-On-Delaware, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

Marking Device Assn. — Annual convention, Oct. 12-14, Hotel Roosevelt, New York. Association headquarters, 912 Chicago Ave., Evanston, Ill.

Steel Boiler Institute, Inc.—Fall meeting, Oct. 12-14, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1308 Land Title Bldg., Philadelphia.

The American Society of Mechanical Engineers—Rubber and Plastics Conference, Oct. 9-11. Hotel Lawrence, Erie, Pa. Society headquarters, 29 West 19th St., New York 18, N. Y.

Gray Iron Founders' Society, Inc.—Annual meeting, Oct. 12-14, Netherland Hilton Hotel, Cincinnati. Society headquarters, 930 National City-E. 6th Bldg., Cleveland.

Industrial Management Society—Annual national industrial engineering and management clinic, Oct. 13-14, Conrad Hilton Hotel, Chicago. Society headquarters, 330 South Wells St., Chicago 6, Ill.

Non-Ferrous Founders' Society—Annual meeting, Oct. 13-15, Grove Park Inn, Asheville, N. C. Society headquarters, 1604 Chicago Ave., Evanston, Ill.

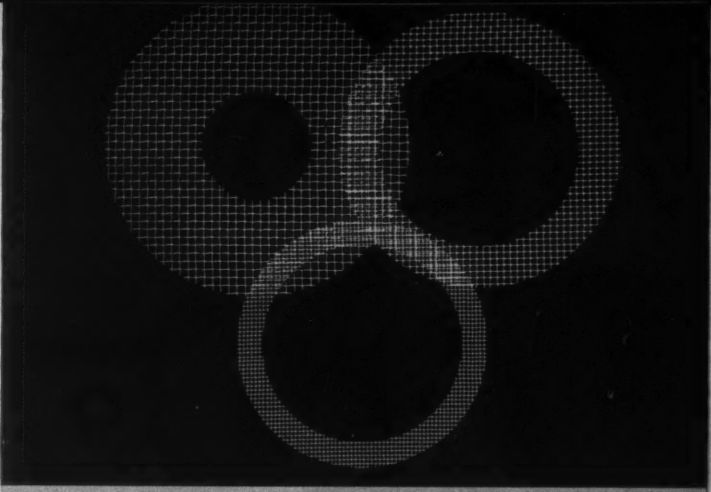
Magnesium Assn. — Annual convention, Oct. 17-18, Cleveland. Association headquarters, 122 E. 42nd St., New York.

American Coke & Coal Chemicals Institute—Annual meeting, Oct. 17-18. The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 711 14th St., N. W., Washington, D. C.

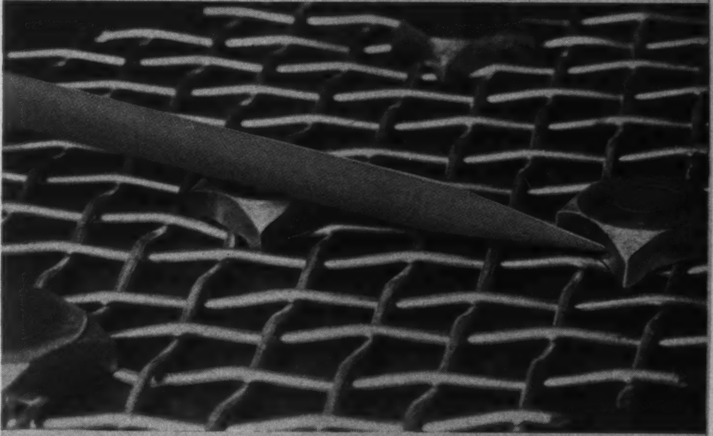
Society for Non-Destructive Testing—20th Annual convention, Oct. 17-21, Philadelphia. Society headquarters, 1109 Hinman St., Evanston, Ill.

DISC SAFETY AND ECONOMY

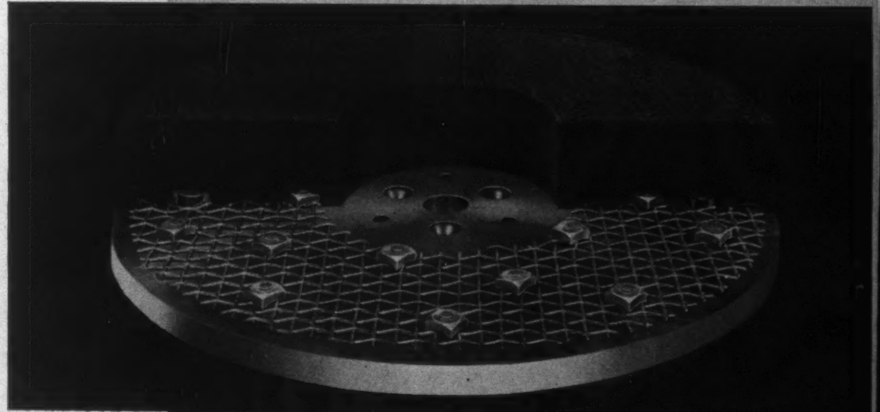
with Gardner Wire-Lokt® construction



Heavy steel wire mesh becomes firmly embedded in the abrasive structure, actually forming a part of the abrasive backing.



Special steel anchoring nuts lock securely into wire mesh. In manufacture, abrasive is forced around and under steel mesh and nuts.



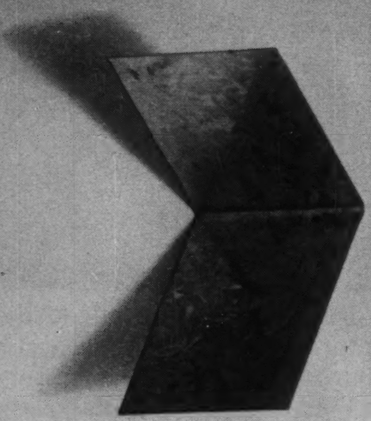
Full value is assured because usable abrasive extends right down to Wire-Lokt backing.

GARDNER

abrasive discs

BELOIT, WISCONSIN

SOFTITE® BY WHEELING


...bend it

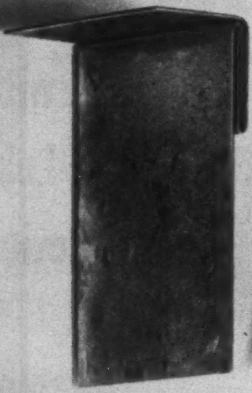
...hem it

...scribe it

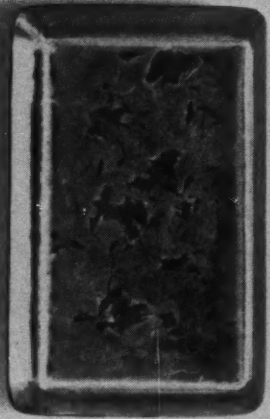
...punch it

...form it

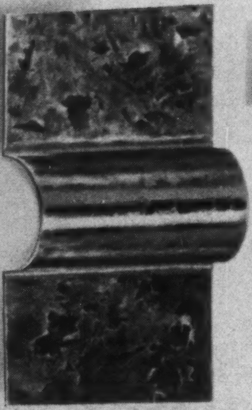
...notch it

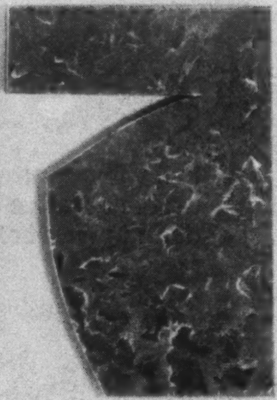

...lock it

...snip it

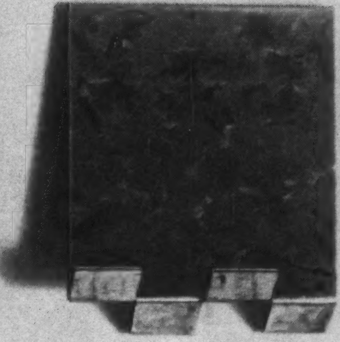

...draw it

...saw it

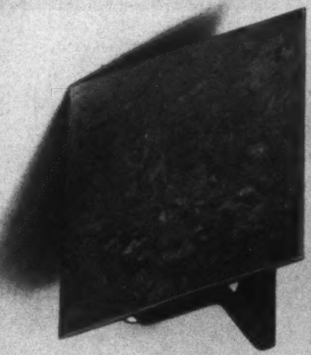

...stamp it


...shear it

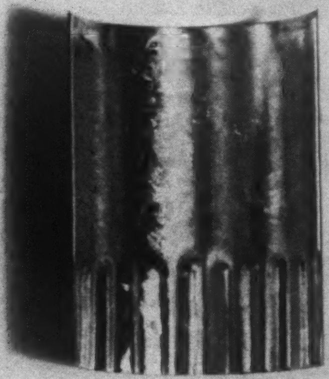
...seam it



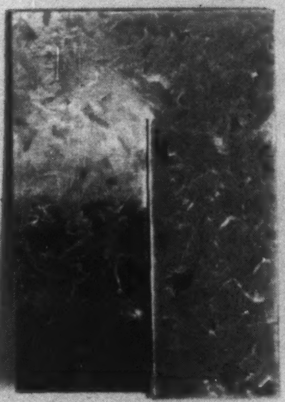
...dovetail it



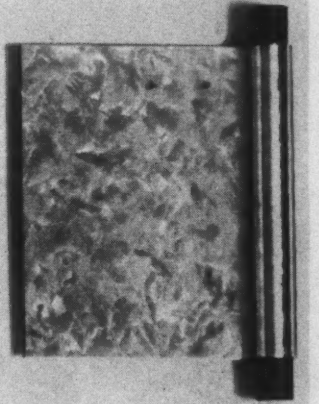
...weld it



...crimp it



...slit it



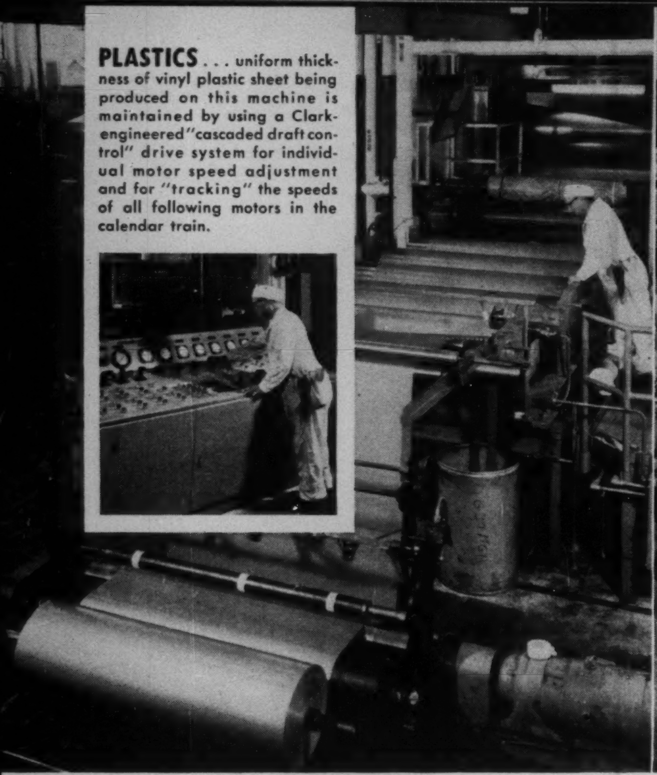
...wire it

OUR CHALLENGE STANDS!

"Anything that can be made of steel sheets can be made of Wheeling SOFTITE® galvanized steel sheets!"

WHEELING STEEL CORPORATION • IT'S WHEELING STEEL!

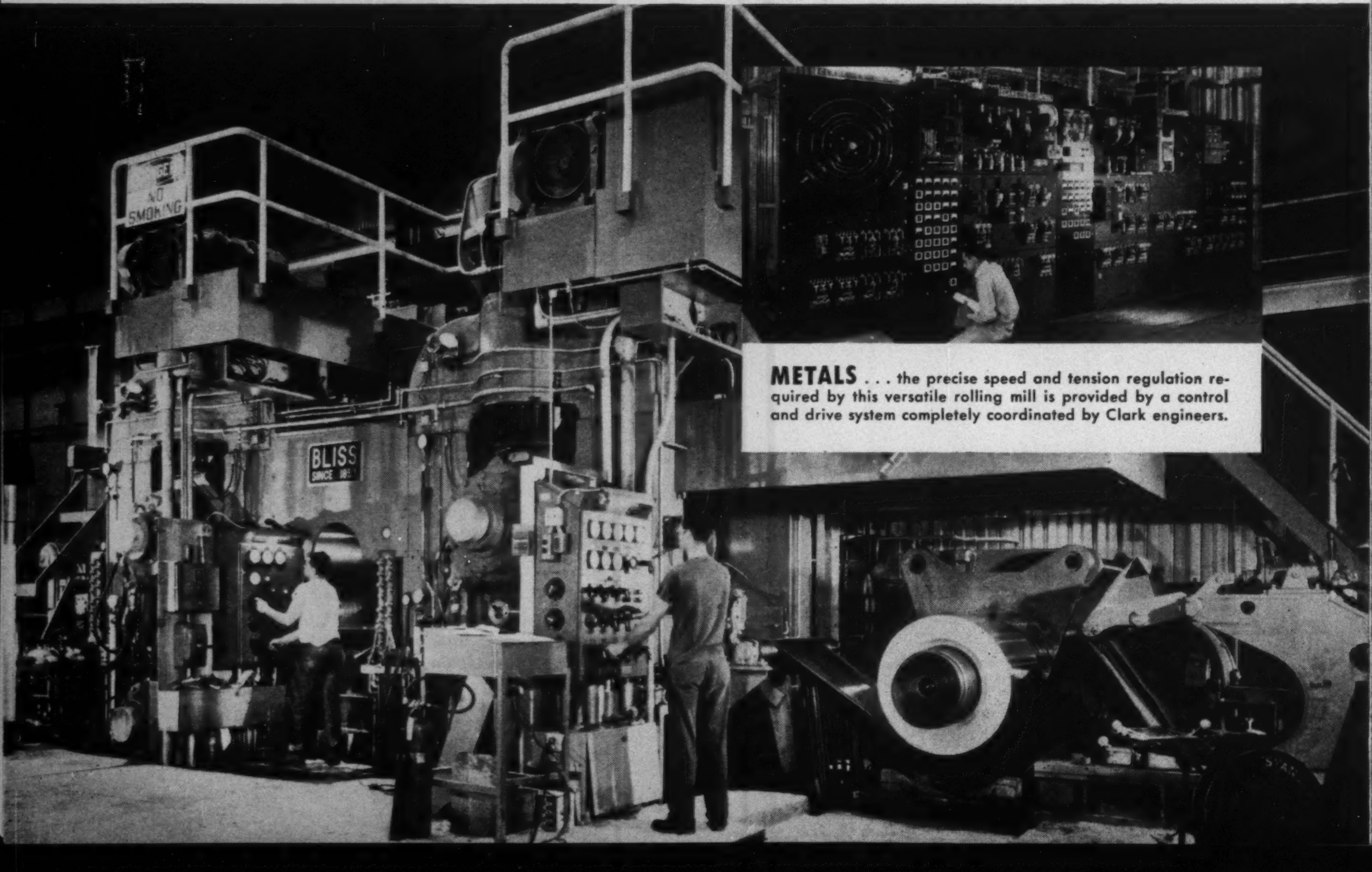
District Sales Offices located at Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco, Wheeling



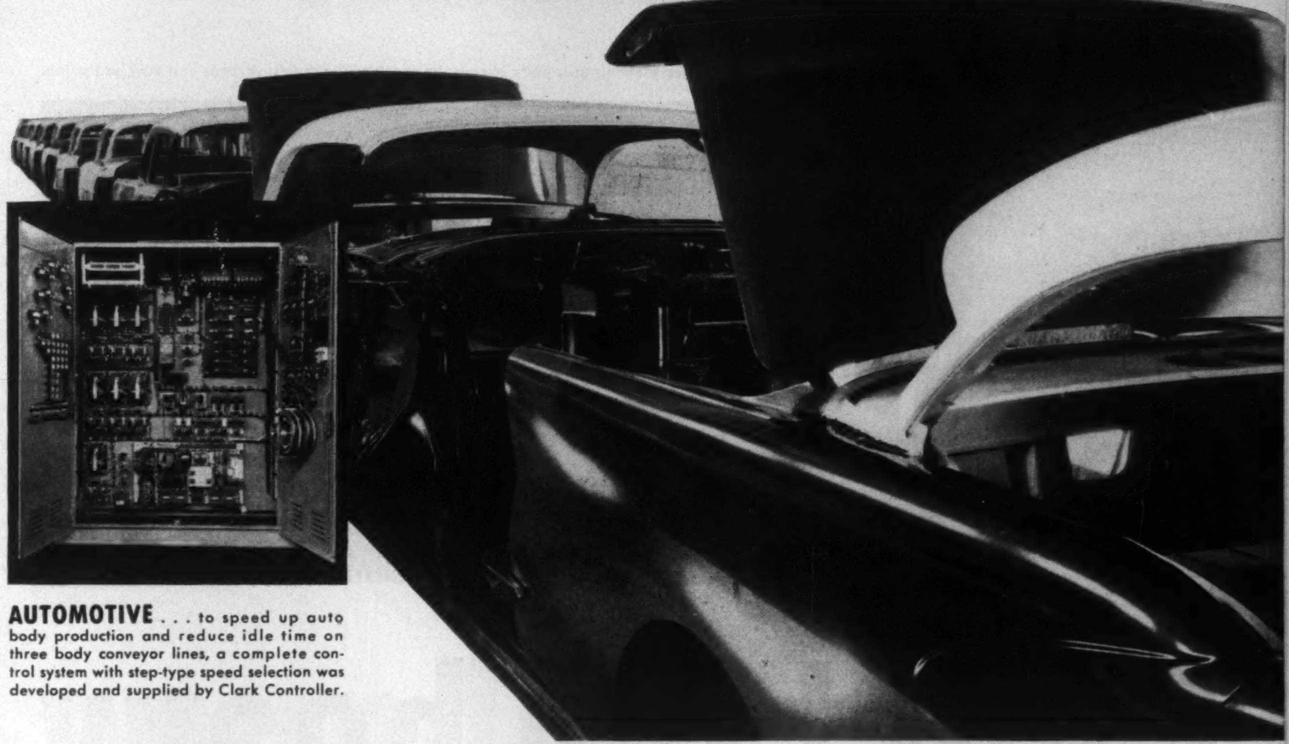
PLASTICS . . . uniform thickness of vinyl plastic sheet being produced on this machine is maintained by using a Clark-engineered "cascaded draft control" drive system for individual motor speed adjustment and for "tracking" the speeds of all following motors in the calendar train.

FOODS . . . automated transfer of bulk sugar from ships to warehouses at rates up to 300 tons per hour is directed by a Clark-engineered and Clark-built control system.

How to get the most from



METALS . . . the precise speed and tension regulation required by this versatile rolling mill is provided by a control and drive system completely coordinated by Clark engineers.



AUTOMOTIVE . . . to speed up auto body production and reduce idle time on three body conveyor lines, a complete control system with step-type speed selection was developed and supplied by Clark Controller.

your machines and processes

Automatic control is the most vital element in today's automated processes, systems and machines.

Clark engineers are specialists in automatic controls, and Clark's control equipment—relays, contactors, push buttons, control centers, etc.—is designed with a thorough knowledge of specific industry requirements.

Clark is therefore ideally qualified to furnish complete coordinated control and drive systems.

Perhaps this great combination of product and experience can help you directly. It makes no difference what industry or type of production machinery or process. More and more automation-minded manufacturers everywhere are turning to Clark for completely coordinated control engineering service and equipment.

From concept to start-up, Clark engineers work as partners with engineering and manufacturing personnel, consulting engineers, contractors, and equipment manufacturers. We welcome the opportunity to show you how they can work for your particular advantage. For more information, contact your nearest Clark Controller sales office. Or, write direct.

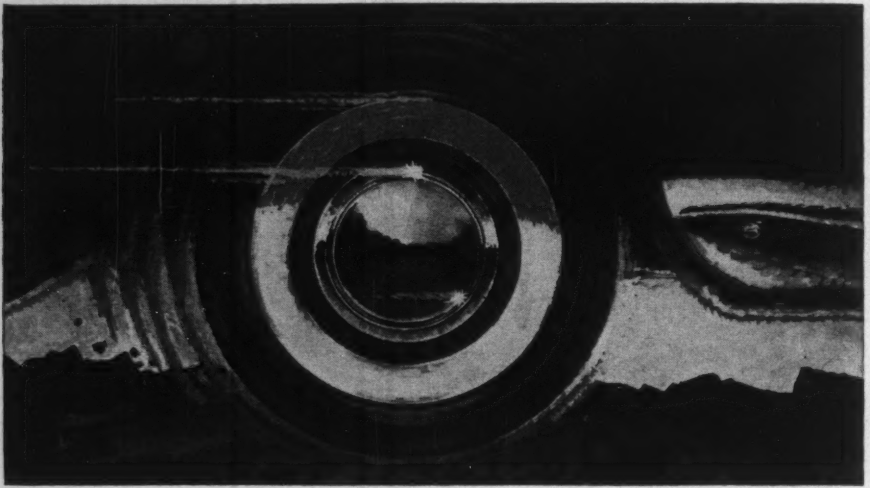
60 A1

The
CLARK CONTROLLER
Company

"Everything Under Control"

Main Plant: *Cleveland 10* • **Western Plant:** *Los Angeles 58*
In Canada: *Canadian Controllers, Limited, Toronto*

Tough and strong—forged steering gear parts absorb the shock of the roughest roads and stay on the job.



Constant heavy

"The steering spindle is the most critical part in an automobile," says a leading manufacturer of forgings. "If it fails, your car is completely out of control and unsteerable. You cannot take a chance with a part like this—*so it is forged*."

Forged parts are strong. They're tough, too, and can take the pounding of rough roads without cracking. Most vital moving parts are forged because forging puts strength where strength is needed.

The quality is in the steel. The quality of the final forging is a reflection of the quality of the steel from which it was produced. For this reason, U. S. Steel carefully controls all processes—from the steel melting to the final inspection.

Carbon or alloy steels. U. S. Steel produces the widest range of quality steels for forgings in various analyses of carbon steels, alloys or stainless to suit the application.

Metallurgical service. Service Metallurgists are available for prompt consultation on any metallurgical problem in all of U. S. Steel's district sales offices.

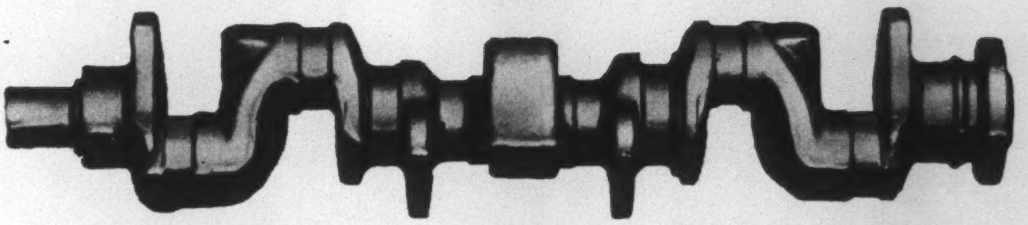
For more information, call your nearest district sales office or write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark

USS

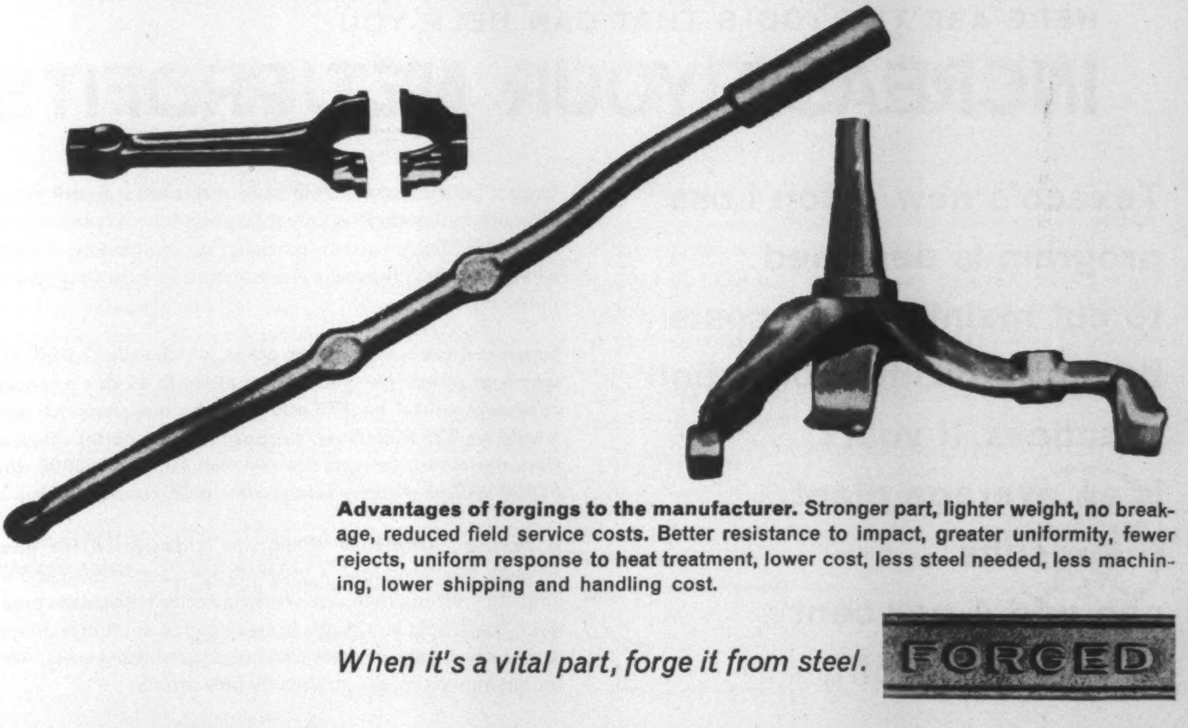
United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company
United States Steel

. . . because it's strong
. . . because it's tough



pounding

steel forgings can take it!



Advantages of forgings to the manufacturer. Stronger part, lighter weight, no breakage, reduced field service costs. Better resistance to impact, greater uniformity, fewer rejects, uniform response to heat treatment, lower cost, less steel needed, less machining, lower shipping and handling cost.

When it's a vital part, forge it from steel. FORGED

MOVIE:
"STOP LOSS"
CO-ORDINATED
BOOKLETS
INFORMATIVE
FILM
PACKAGE
"STOP
LOSS"
Organized
Lubrication

MOVIE: "STOP LOSS WITH ORGANIZED LUBRICATION," a new 20-minute color-and-sound film created to show the opportunities for cost control through Organized Lubrication.

EDUCATIONAL FILM PACKAGE for plant departments consists of movies on greases, hydraulic oils, cutting oils, etc., that may be selected after seeing the "Stop Loss" film.

HERE ARE THE TOOLS THAT CAN HELP YOU

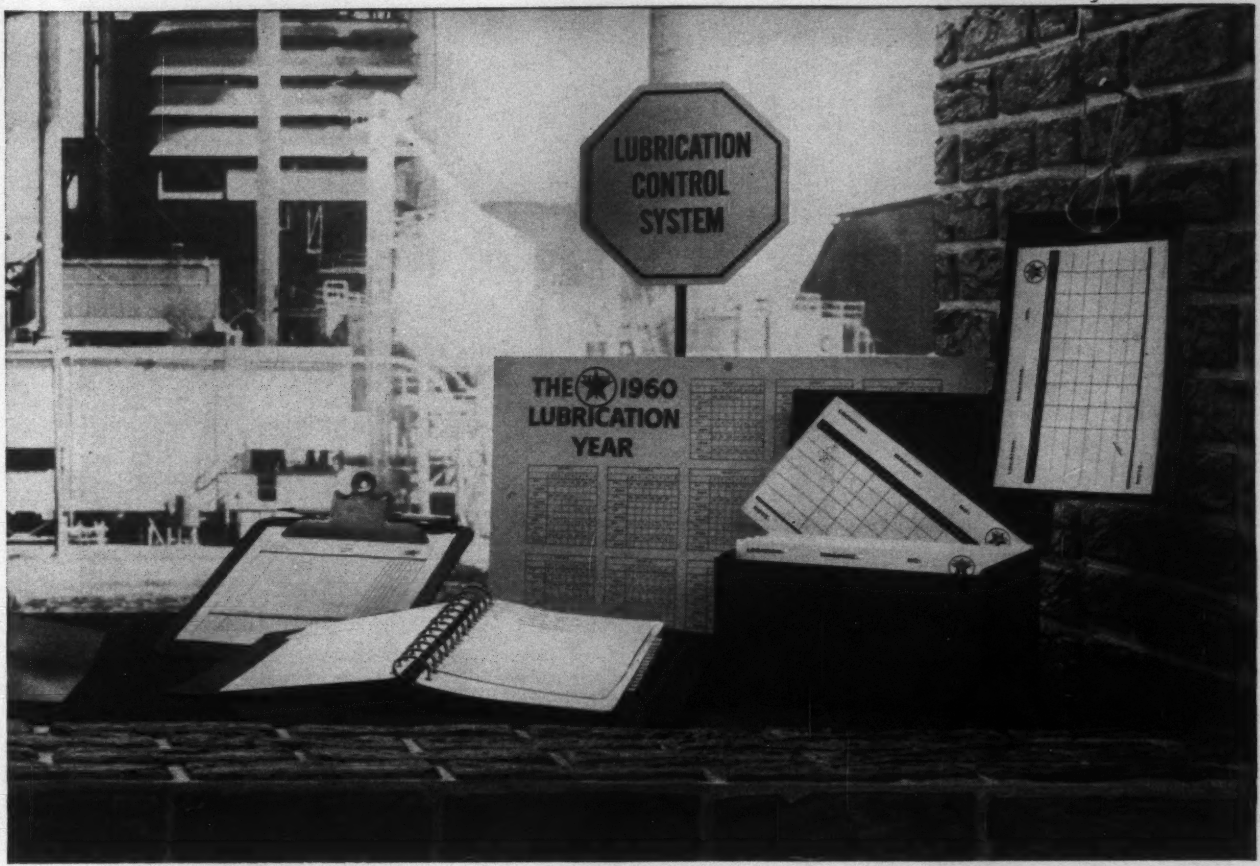
INCREASE YOUR NET PROFITS

Texaco's new "Stop Loss" program is designed to cut maintenance costs by modernizing lubrication practices. If yours is an average plant, the results can add 4 per cent to your net profit.

Even if your plant is an efficient operation, it is still virtually certain that there is an opportunity for cost control you are overlooking—either partially or completely. Here's what the Small Business Administration says in a recent publication:

Suppose there is an average plant, which sells $1,000,000 worth of goods per year. The net profit of this average company would be $73,400 and the maintenance cost would be $29,900. Now, suppose that by *better lubrication*, maintenance costs are reduced 10%, or $2990, *the $2990 will go directly into profit*—an increase of 4%.

A Texaco "Stop Loss" Program is designed for you. Texaco has developed a program specifically designed to help cut your maintenance costs via better lubrication practices. It will help you increase machine life, minimize downtime, reduce lube inventory, even cut purchasing costs. And the savings you make go directly into profits.



CO-ORDINATED BOOKLETS on the film subjects and others can be used as guides in specific areas.

TEXACO LUBRICATION CONTROL SYSTEM takes the guesswork out of your lubrication scheduling. It costs almost nothing to install, yet can add thousands of dollars a year to profits.

BY AS MUCH AS 4 PER CENT!

Can your plant pass this test? If the answer is "no" to any of the following questions, it is almost certain that a Texaco "Stop Loss" Program can improve your profit picture.

1. Is there a central source of responsibility in your plant for *all* lubrication? Yes ☐ No ☐
2. Can your machine operators devote all their time to production without worrying about lubrication? Yes ☐ No ☐
3. Is there any system for making sure that equipment gets lubricated in the right spots at the right time? Yes ☐ No ☐
4. Have you had a lubrication study made to eliminate costly duplication of lubricants? Yes ☐ No ☐
5. Are your oilers qualified men with knowledge of mechanisms lubricated? Yes ☐ No ☐

See for yourself how "Stop Loss" works! Texaco has just released a new color-and-sound movie to dramatize the benefits of good lubrication practices. It's called "Stop Loss through Organized Lubrication" and we think it would be valuable to you to see it. For a showing in your plant soon, mail in the coupon today!

Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

MAKE YOUR RESERVATION TODAY!

TEXACO INC., Dept. IA-161
135 East 42nd Street
New York 17, New York

I would like to see "Stop Loss through Organized Lubrication." Please call to arrange a showing in my plant.

TEXACO

Name__________ Title__________
Firm__________
Address__________
City__________ Zone____ State______

How are they doing down on the farm?

Nowadays they're doing everything a lot easier, thanks to modern power-operated farm machinery.

And farm machinery producers have learned that their lot can be a lot easier, too, when they specify Ostuco Tubing. That's because there's no compromising with custom-quality Ostuco Tubing. Consistently you receive the exact tubing you want — the size, length, grade — with the strength and tolerances you need. For machined parts, you get our recommended rough size guaranteed to clean up.

In addition to these advantages, Ohio Seamless will fabricate tubular parts to your specification. Contact your nearest Ohio Seamless representative, or send part drawings to the plant at Shelby, Ohio—Birthplace of the Seamless Steel Tube Industry in America.

A-1358A

Model illustrated built to 3.5 mm scale.

OSTUCO
STEEL TUBING

Complimentary Copy of new Bulletin CS60 "Ostuco Steel Tubing" sent on request.

OSTUCO
SHELBY, OHIO

OHIO SEAMLESS TUBE

Division of Copperweld Steel Company • SHELBY, OHIO

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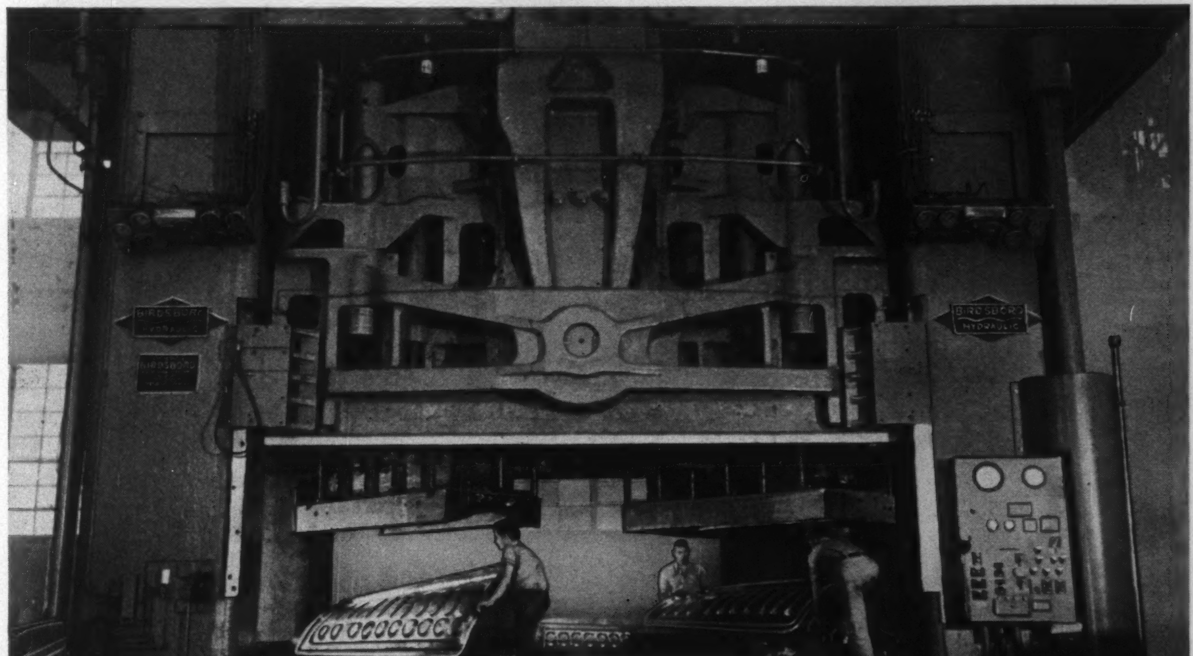
CANADA: Railway & Power Engr. Corp., Ltd. EXPORT: Copperweld Steel International Company, 225 Broadway, New York 7, New York

BIRDSBORO *Presses . . . designed to meet changing method, material, market and cost problems*

• Birdsboro is gearing its press designs in the same way you are gearing your entire business . . . for both present *and* the future.

Changes in markets, methods, materials and costs are pushing the "future" closer and closer to today. To help you meet these problems, Birdsboro presses are versatile and rugged enough to fit into your production future as well as the present.

Advanced design, triggered by imagineering, provides you with longer usable life in each press. Ask your Birdsboro representative about specific examples. *Sales Department:* Reading, Pa., *Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.



HP41-59

BIRDSBORO
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BIRDSBORO CORPORATION

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • ROLLS • ELECTRIC STEEL CASTINGS: Carbon, Low Alloy and STAINLESS STEEL

Laboratory facilities at Standard have kept well in step with the revolutionary advances which have been made in the field of metallurgy during the past decade. Plant facilities, too, are geared to produce even the most exotic of special alloys which today's industry demands.

And Standard's famed personalized service means that your most difficult problems can be resolved by our metallurgists and engineers and assures a finished product which meets your most exacting requirements, delivered in record time. Write today for the illustrated booklet, "Quality Control at Standard."

Standard Steel Works Division
BALDWIN · LIMA · HAMILTON
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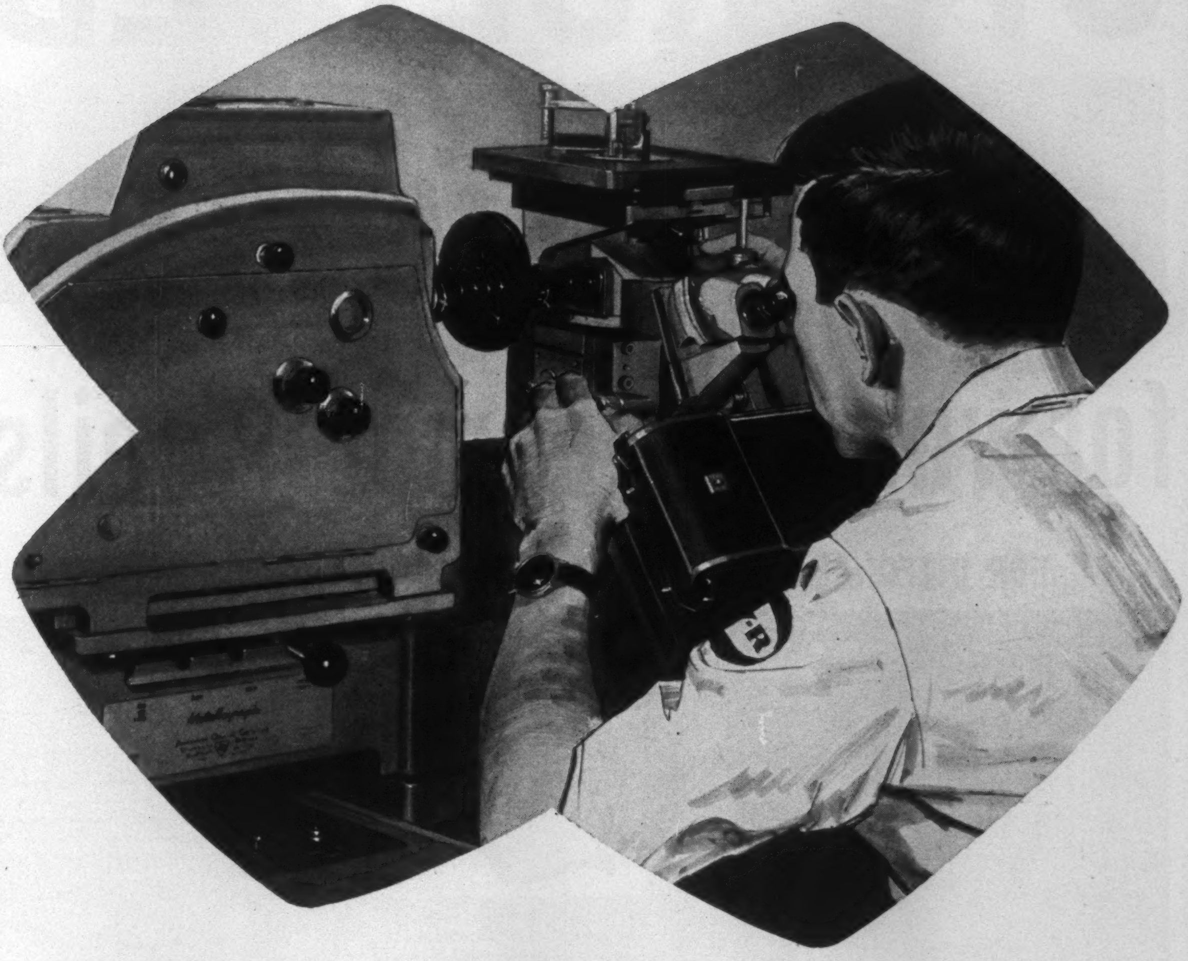
Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

V-R CREATING THE METALS THAT SHAPE THE FUTURE



Constant Checking Assures Carbide Consistency

It's no wonder that V-R carbides give consistent performance under any circumstance. Carbide consistency is largely due to the varied and frequent quality checks at every step in production processing. Here, we see a metallograph being used to check grain structure and absence of porosity against rigid standards. Similar checks are made constantly to assure proper hardness, density, and transverse rupture strength. Each and every piece of any V-R grade always will perform the same. Yes, quality control here at V-R is important to you.

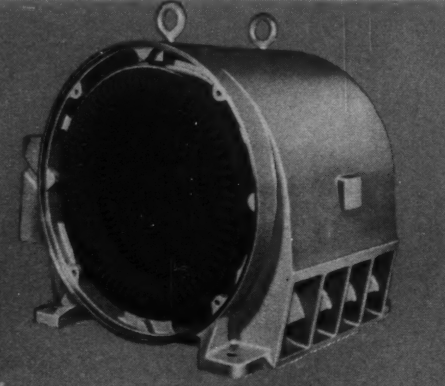
V-R VASCOLOY-RAMET
830 MARKET STREET • WAUKEGAN, ILLINOIS

C-801

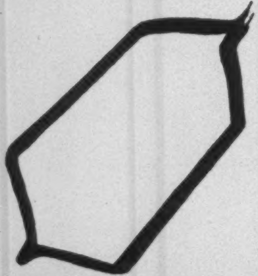
UNEXCELLED PROTECTION

for vulnerable motor coils

FOR INTEGRAL H. P. MOTORS WITH FORM-WOUND COILS

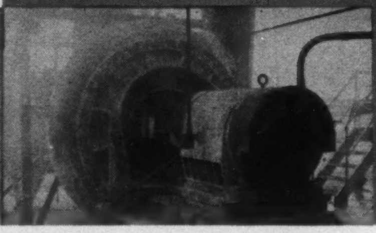


WOUND STATOR—Core and frame are dipped in EPA-SEAL epoxy resin and baked before winding. Slot cells are epoxy-glass, and all connections are taped with epoxy-mica and glass tape. After winding, the entire stator is given the EPA-SEAL vacuum-pressure process described below.



IMPREGNATED COIL—Finished coil is entirely covered with glass tape before impregnation. Where leads leave the coil, special epoxy compound seals against entrance of moisture. The entire slot section is protected by epoxy-mica wrapper.

NOW OPERATING. One of the first epoxy-insulated, form-wound motors in service was the 350 hp Epa-Seal motor shown below. It operates under severe corrosive atmospheric conditions, plus constant spray from nearby cooling tower.



The Elliott EPA-SEAL epoxy insulation system for integral hp motors includes the application of epoxy resins to all vulnerable parts, and a unique process of vacuum preconditioning and pressure impregnation. Vacuum preconditioning is accomplished by placing wound stators in a tank which is sealed and evacuated. This removes all air and moisture from within the coils and coil slots.

Then while still under vacuum, impregnation is accomplished by pumping special epoxy resin into the sealed tank under pressure. The combined vacuum and pressure treatment assures deep penetration of the resin into the innermost spaces of the coils and coil slots. The result is a tough, impervious, resilient, void-free protection against salt water, acids, alkalis, solvents, cutting oils, carbon-black, abrasives. This exclusive Elliott C-W insulation withstands heat, cold, vibration, resists chipping and cracking, takes cold shock and thermal cycling unharmed. EPA-SEAL epoxy-insulated motor stators with form-wound coils have been completely submerged in water for three months without impairment of insulation resistance or dielectric strength.

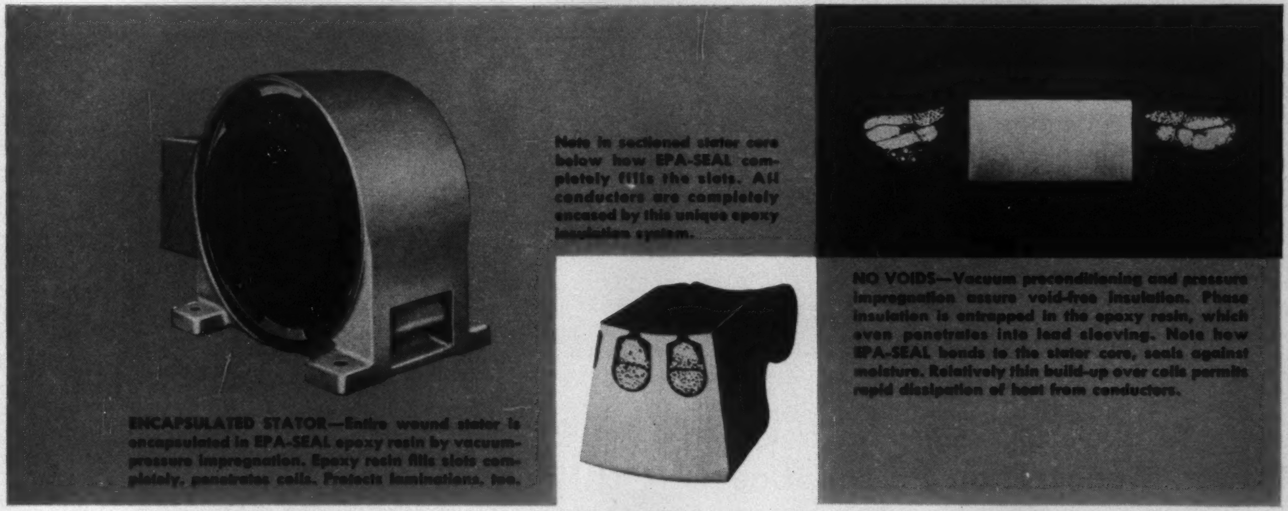
WO-1

Elliott's tough, resilient

EPA-SEAL

epoxy insulation system

FOR INTEGRAL H. P. MOTORS WITH RANDOM-WOUND COILS



Note in sectioned stator core below how EPA-SEAL completely fills the slots. All conductors are completely encased by this unique epoxy insulation system.

NO VOIDS—Vacuum preconditioning and pressure impregnation assure void-free insulation. Phase insulation is entrapped in the epoxy resin, which even penetrates into lead sleeving. Note how EPA-SEAL bonds to the stator core, seals against moisture. Relatively thin build-up over coils permits rapid dissipation of heat from conductors.

ENCAPSULATED STATOR—Entire wound stator is encapsulated in EPA-SEAL epoxy resin by vacuum-pressure impregnation. Epoxy resin fills slots completely, penetrates coils. Protects laminations, too.

For motors with random-wound coils, the method customarily used for encapsulating consists of applying an external coating over exposed coil ends. But with the Elliott EPA-SEAL system, the entire wound stator is encapsulated in EPA-SEAL epoxy resin by vacuum-pressure impregnation. In addition, stator and rotor laminations are treated with a special anti-corrosive epoxy coating. All hardware is protected by a corrosion-resistant treatment. Weatherproof conduit boxes are standard. Motors are adaptable to NEMA Type I weather protection. Epa-Seal random-wound motors have run while completely submerged in water for more than 1000 hours, without failure.

Elliott Epa-Seal motors are ideally suited for service in chemical and petrochemical plants, paper mills, rubber mills, in deep mines or coastal service—wherever moisture or corrosive atmospheres demand superior motor insulation.

INSULATION SYSTEMS FOR ELLIOTT CROCKER-WHEELER MOTORS

WRITE FOR **New Bulletin PB 6000-12, giving further details on the remarkable EPA-SEAL insulation system. Crocker-Wheeler Plant, Elliott Company, Jeannette, Pa.**

ELLIOTT Company
CROCKER-WHEELER PLANT • JEANNETTE, PA.

HYSTER
HYSTER

Now! Monotrol on Pneumatics—

Only

HYSTER® has it!

EXCLUSIVE MONOTROL CONTROL SYSTEM—Performance proved on Hyster cushion tire trucks—now available on pneumatics.

FAST, SAFE HANDLING—Driver's right foot controls acceleration—forward-reverse. Left foot controls *braking*—truck *inching*. Hands free for full-time steering and load control.

EASIEST TRUCKS TO DRIVE—Monotrol with Hystamatic transmission means more production per manhour—reduced driver fatigue.

CALL your Hyster dealer for a demonstration.

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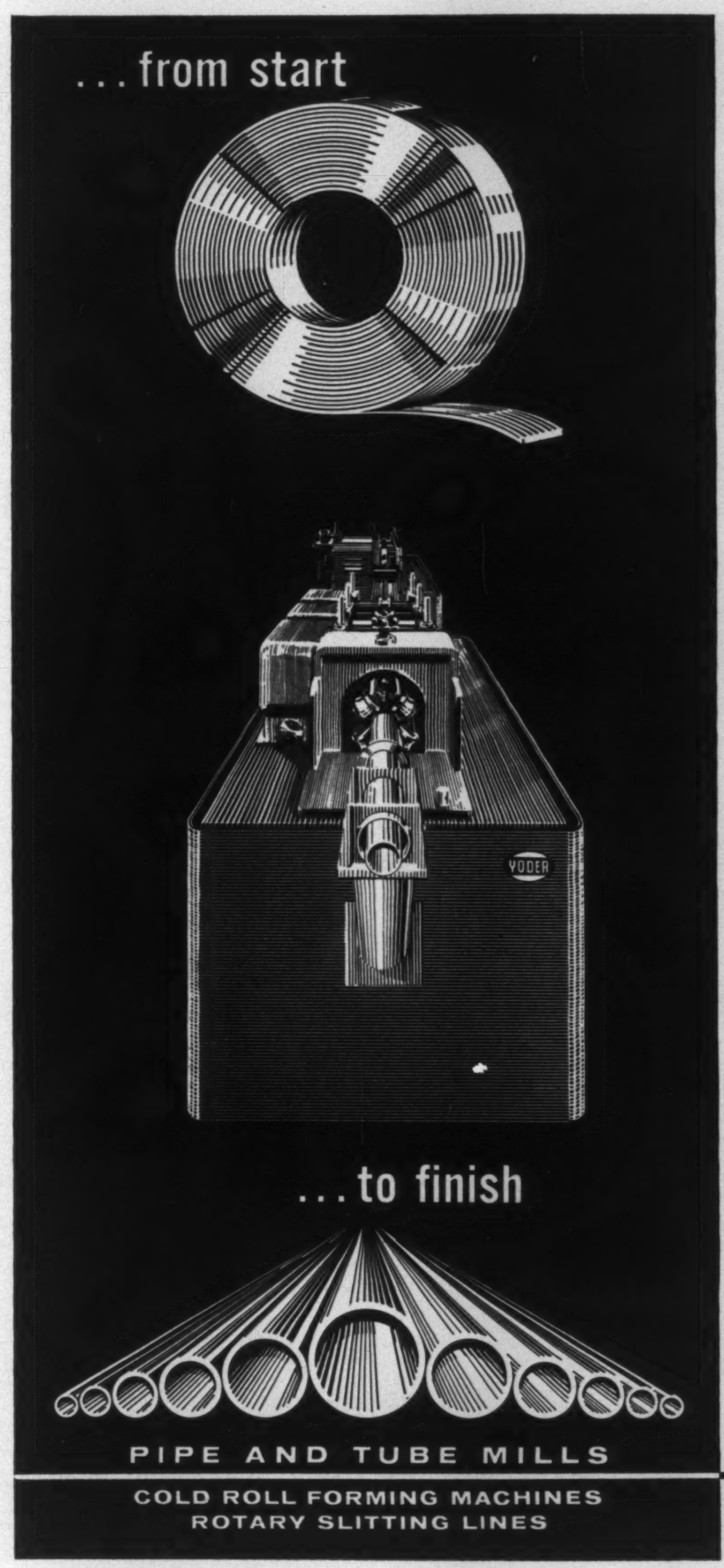
Factories: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill. • Nijmegen, The Netherlands • Glasgow, Scotland • Sao Paulo, Brazil • Sydney, Australia (Licensee)

HYSTER COMPANY
INDUSTRIAL TRUCK DIVISION
P. O. Box 847 Danville, Illinois


. . . from start
YODER
. . . to finish
PIPE AND TUBE MILLS
COLD ROLL FORMING MACHINES
ROTARY SLITTING LINES

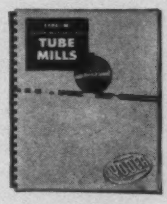
YODER PIPE & TUBE MILLS

A Yoder engineer can help you realize remarkable savings in the manufacture of ferrous or non-ferrous pipe or tube. He can show you how present Yoder Pipe or Tube Mill owners are increasing production, lowering over-all manufacturing costs and reducing downtime through use of Yoder Mills.

If your products require pipe or tubing from 5/16" to 26" diameters, Yoder Pipe or Tube Mills and accessory equipment can help you produce your product more efficiently to meet today's competitive markets.

In addition to Pipe or Tube Mills, Yoder engineers and builds a complete line of Slitting equipment and Cold Roll-Forming Machinery.

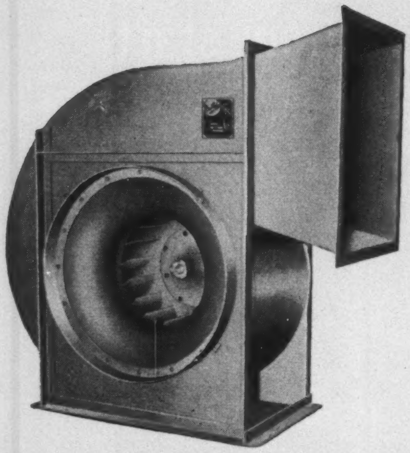
For complete information on Yoder Tube Mills . . . send for the fully illustrated, 64 page Yoder Tube Mill book . . . it is yours for the asking.



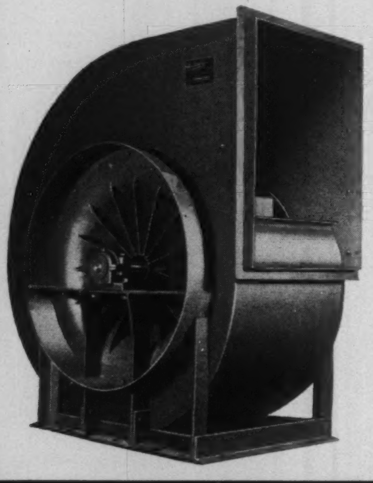
THE YODER COMPANY
5510 Walworth Ave. • Cleveland 2, Ohio

ENGINEERING
YODER
MANUFACTURING

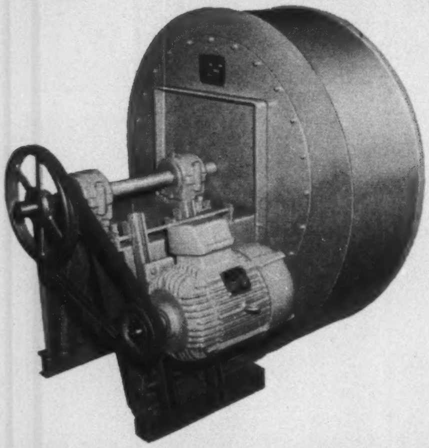
Realize the Lower Cost of Quality Fans



"Buffalo" Type "CR" Fan



"Buffalo" Type "BL" Fan



"Buffalo" Industrial Exhauster

Without a doubt — the dependable performance of quality built fans pays off in longer, more effective, trouble-free service. At Buffalo, we call this the "Q" factor . . . the highest quality you can get. Here are 3 examples of what this can mean to you . . .

For supplying moderate pressure ventilating, air conditioning and air cleaning systems, the "Buffalo" Type "BL" Fan is ideal. From inlet through wheel to housing, the "BL" is engineered for quiet, efficient, economical operation. The "Buffalo" designed non-overloading characteristic assures stable output from free delivery to shutoff. Buffalo's traditional durable construction assures long, maintenance-free life. Capacities to 500,000 cfm. Write for Bulletin F-104.

For severe industrial service the "Buffalo" Type "CR" Fan is unsurpassed. Fan efficiency is increased by the same design factors that reduce wear to a minimum. A unique radial blade plus maximum streamlining through the entire fan accomplishes this dual purpose. Long, productive fan life is assured by Buffalo's extra-heavy duty construction throughout. For full details, write for Bulletin FD-205.

For rugged air and material moving jobs you can rely on "Buffalo" Industrial Exhausters. Special units will move hot gases from 200° F. to 850° F. For handling corrosive fumes, actual users prove that "Buffalo" Rubber-Lined Exhausters will outlast standard metal fans as much as twelve to one. Efficient material wheels are available for moving emery dust, saw dust, chips, long shavings and many other materials. There's a "Buffalo" Industrial Exhauster to fit your "tough" application. Write for Bulletin FI-110.

For full information on these and every type "Buffalo" Fan, call in your nearest "Buffalo" Representative. Or write us direct, outlining your air moving problems.

"Buffalo"

BUFFALO FORGE COMPANY
Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

'Buffalo' Air Handling Equipment to move, heat, cool, dehumidify and clean air and other gases.

'Buffalo' Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.

'Buffalo' Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.

Squier Machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

ACT

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ACT (Application Consulting Team) has been create out of the merger of Mexico Refractories and Kaise Refractories to help the steel industry profit fully fro this outstanding fact:

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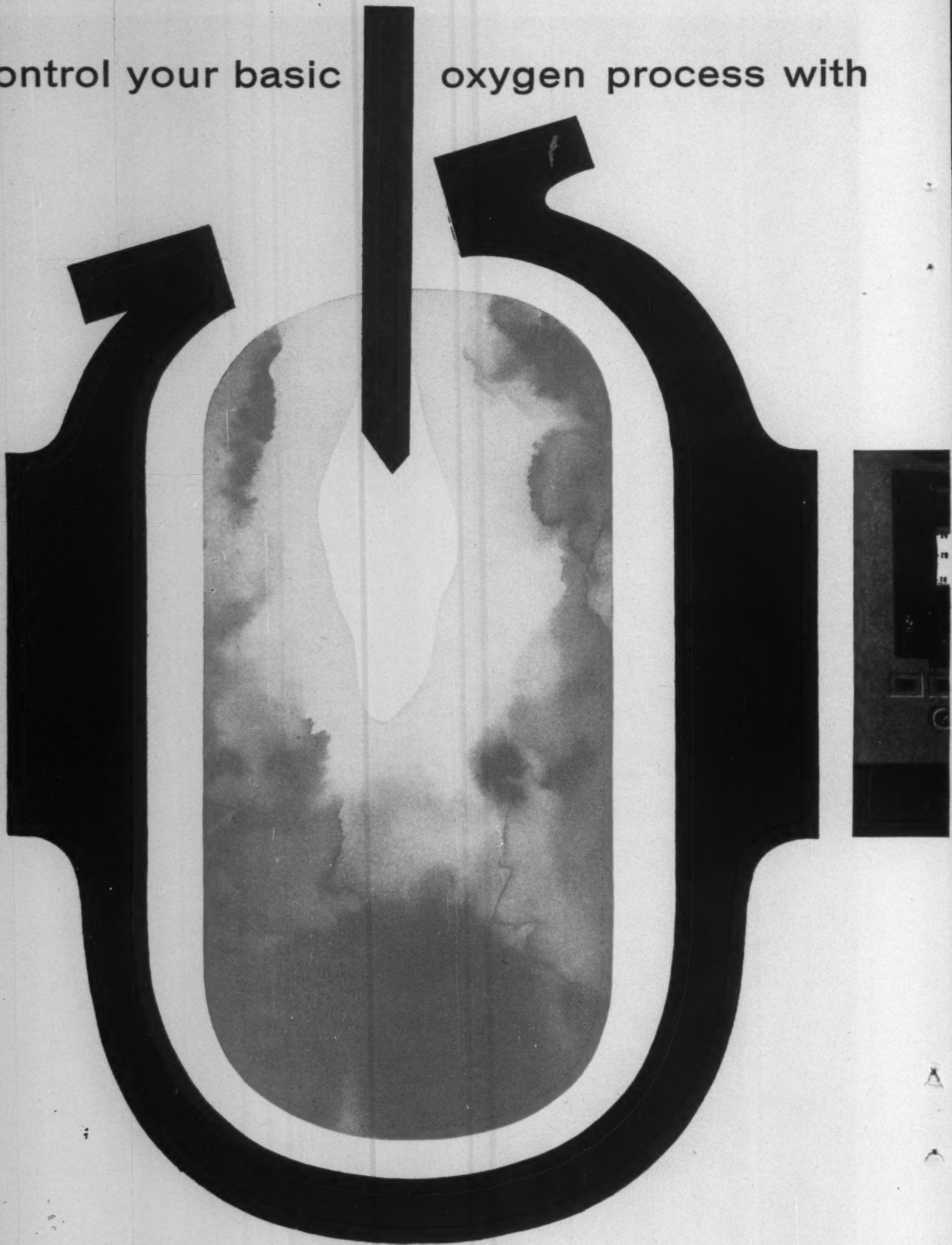
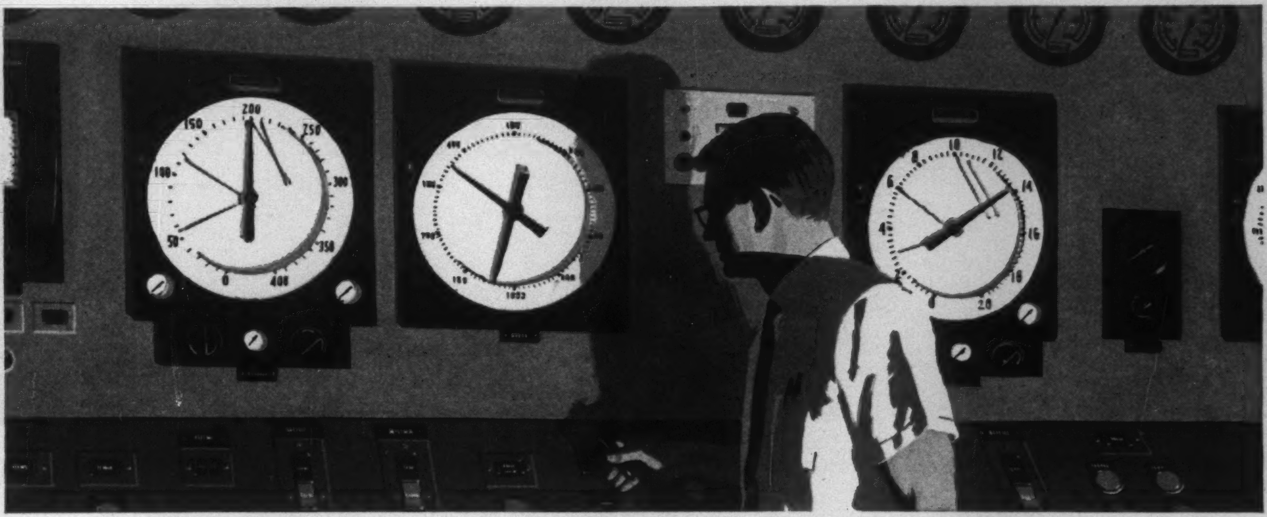
Control your basic oxygen process with



a Honeywell instrumentation system

The new basic oxygen process for steelmaking requires fast, precise, integrated control of all variables—oxygen pressure and flow in particular. Honeywell gives you a *complete system* of instrumentation—from primary elements to computer—tailored to the process and to the individual needs of your mill. This system brings extra advantages to the oxygen process.



Honeywell's application engineers will help you choose the proper components for your process from the broad line of Honeywell products—products proved throughout industry. Honeywell instruments, with electric or pneumatic control, are available for all parts of the oxygen process operation.

The Honeywell all-electric oxygen flow computer measures, records, and controls oxygen mass flow rate—automatically and continuously totalizing the oxygen used for all heats in all converters. The computer compensates automatically for temperature and pressure variations—and delivers the exact number of pounds of oxygen the charge requires.

The Honeywell instrumentation system holds temperature, pressure, humidity, and electrical power at optimum levels at every step of the process—protecting all the equipment—process vessel linings, exhaust gas hood, ducts, and precipitator.

Custom-designed Honeywell systems for the basic oxygen process are now performing in major steel mills across the country. The mills gain Honeywell's unique experience in controlling the oxygen process as well as the assurance of reliable, single-source responsibility for the entire system. Your nearby Honeywell field engineer can give you complete details. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Penna. In Canada, Honeywell Controls, Ltd., Toronto 17, Ont.

75th YEAR PIONEERING THE FUTURE

Honeywell

First in Control

H HONEYWELL SINCE 1885

Another example of National Roll quality control

National's Deac Scholl, sales manager, and Bill Curran, works manager, talk rolls by one of the largest ever cast, a 38½x160" plate roll.

We "live" with your rolls after shipment, too

National Roll has only one business: rolls. This product concentration has enabled National to build a sales, service and production staff with specialized knowledge of roll making. Experienced men give every roll order placed with National "personalized" attention, all the way from consultation with the customer before the order is placed to follow-up on the roll's performance throughout its service life.

This emphasis on customer service is one reason for the confidence so many steel makers are placing in National as a supplier of steel, nodular iron and cast iron rolls.

A new brochure entitled "This is the New National Roll" explains many more of National's unique advantages as a roll supplier. We will be glad to send you a copy. It shows you why . . .

National's the growing name in rolls

NATIONAL ROLL & FOUNDRY DIVISION

GENERAL STEEL CASTINGS CORPORATION, Avonmore (Westmoreland County), Pa.

General Steel Castings Corporation, General Offices: Granite City, Illinois • Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.

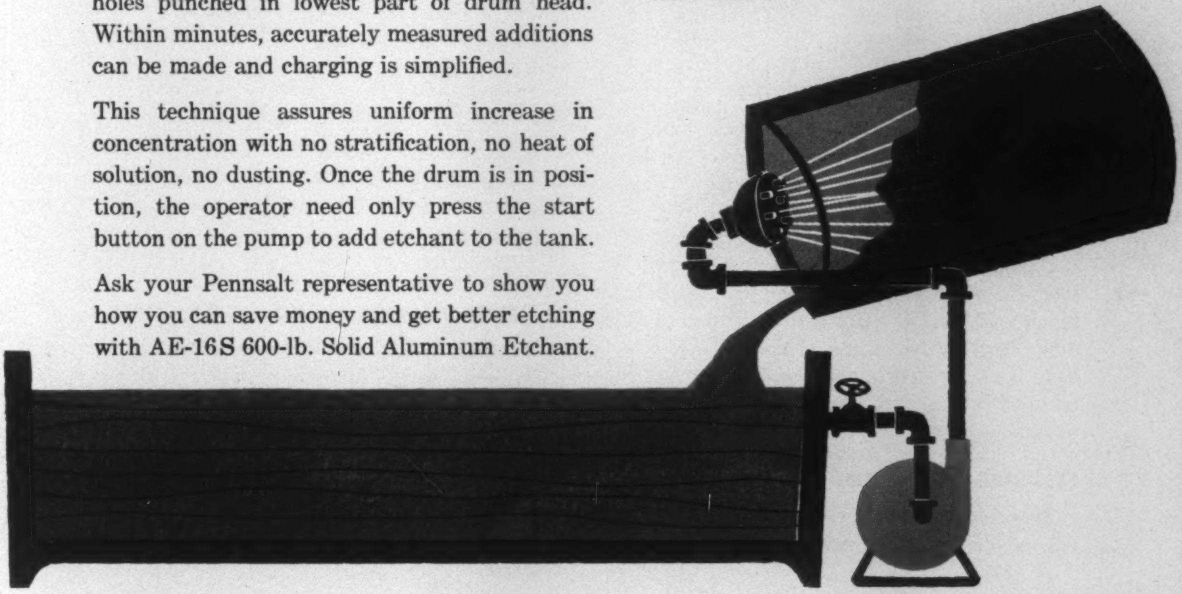
NOW ! ALUMINUM ETCHANT AT THE LOWEST COST EVER !

A new 600-lb. drum size and a new make-up technique now make Pennsalt's popular AE®-16S Solid Aluminum Etchant a better buy than ever. AE-16S in economy-size drums gives you a clean, uniform etch . . . plus easier handling and better etchant performance . . . all at the lowest materials cost possible for a blended etchant!

Gives push-button control. A 600-lb. drum of Pennsalt AE-16S Solid Aluminum Etchant is positioned over etching tank; etchant solution is pumped from tank to a specially-designed spray nozzle head which is placed in drum opening; spray nozzle sprays solution directly on etchant, dissolving it at a uniform rate; concentrated solution then returns to tank through holes punched in lowest part of drum head. Within minutes, accurately measured additions can be made and charging is simplified.

This technique assures uniform increase in concentration with no stratification, no heat of solution, no dusting. Once the drum is in position, the operator need only press the start button on the pump to add etchant to the tank.

Ask your Pennsalt representative to show you how you can save money and get better etching with AE-16S 600-lb. Solid Aluminum Etchant.



Write for complete details on this new plan today. Be sure to check Pennsalt's other aluminum processing chemicals, including emulsion cleaners, inhibited alkaline cleaners, deoxidizing cleaners, flake etchants—sold and serviced by our nationwide organization.

. . . a better start for your finish®

Pennsalt Chemicals®
ESTABLISHED 1850

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New! Now Bethlehem forges *every* hardened steel roll from vacuum-degassed steel!

Bethlehem vacuum-degassed steel minimizes the hazard of roll breakage.

Pint size, king size, every in-between size. Now Bethlehem forges *every* hardened steel roll from vacuum-degassed steel.

PIONEER IN "VACUUM CASTING"

Bethlehem pioneered the development and use of vacuum-degassed ingots for highly stressed applications in the electric power, atomic energy, and other industries.

With our advanced steel-pouring techniques, we can pour molten steel from a furnace ladle to a secondary ladle within a vacuum chamber, and thereby remove harmful gases (we can also pour directly into a mold in the vacuum chamber). The secondary ladle is then taken out of the chamber and ingots of suitable size for hardened steel rolls can be cast under a blanket of inert gas.

LESS GAS MEANS SOUNDER STEEL

Because the vacuum-casting method reduces the volume of hydrogen and other gases, the steel is sounder, tougher, and cleaner than air-cast steel. It is this greater internal soundness which reduces the hazard of roll breakage.

OVER 350 ROLLS NOW IN SERVICE

In the past several years, we've produced and shipped more than 350 large, vacuum-degassed hardened steel rolls. The outstanding performance of these rolls in our own mills confirms the superior soundness of vacuum-cast rolls as compared to air-cast rolls.

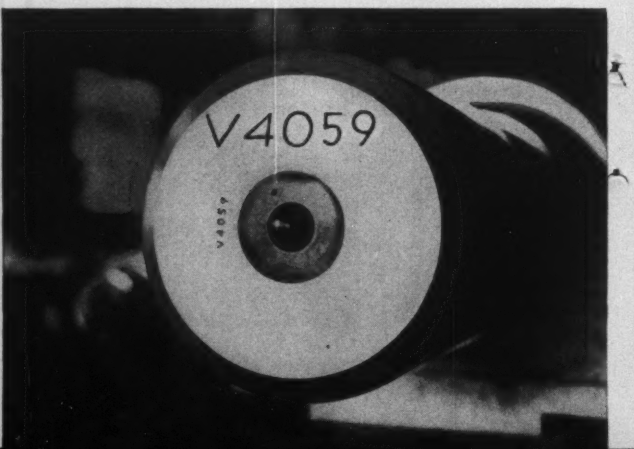
FAST DELIVERY . . . NO EXTRA COST

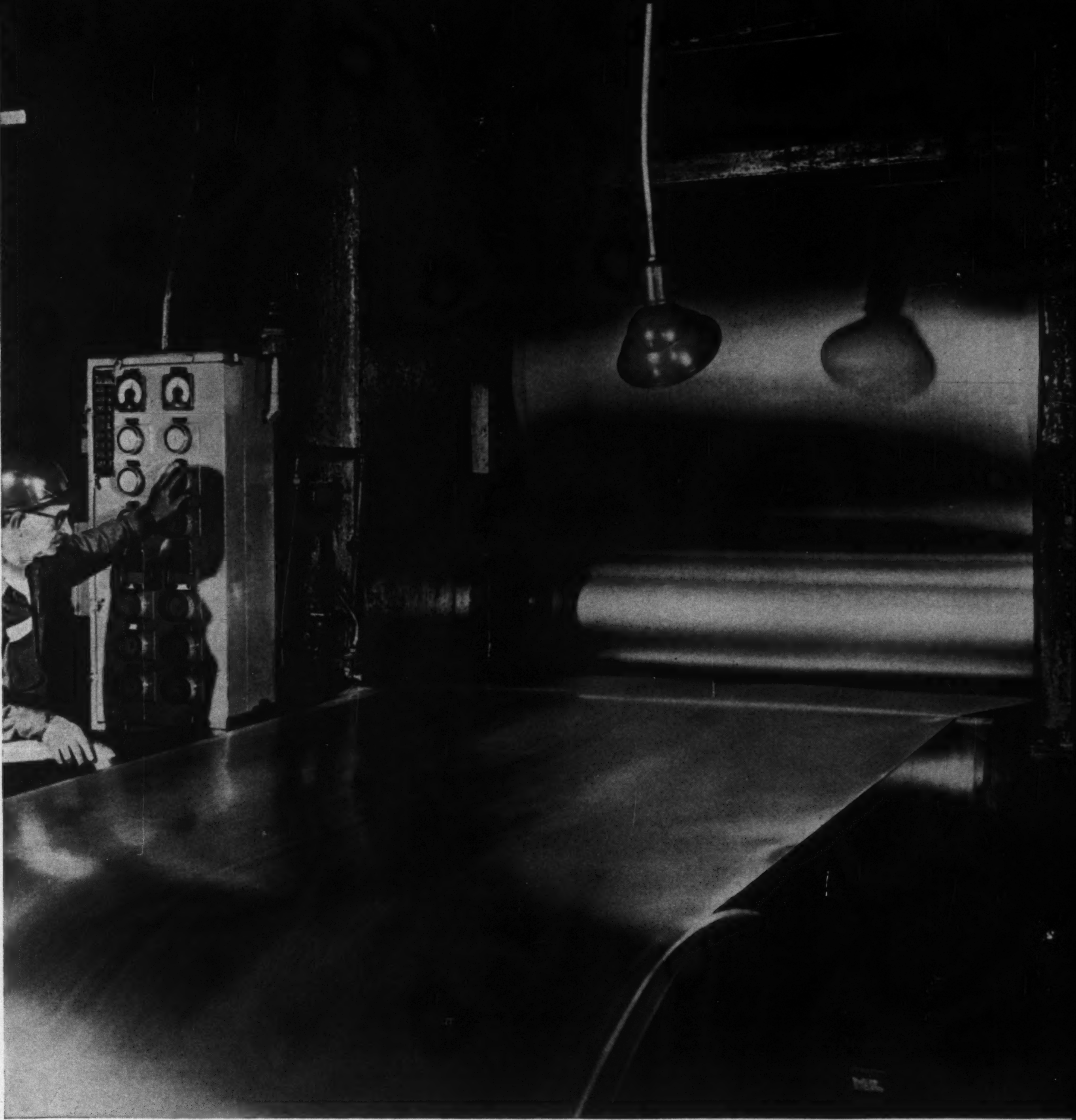
You have everything to gain (less roll breakage), nothing to lose (no price extra) by making your next purchase of hardened steel rolls Bethlehem vacuum-degassed rolls. Deliveries are excellent. Our sales offices are ready to give you the *whole* interesting story of this new Bethlehem development. Call or write the office nearest you today. Or write to us at Bethlehem, Pa.

LOOK FOR THIS LABEL on the packing of the hardened steel rolls you buy. It's your guarantee that your rolls are forged from Bethlehem vacuum-degassed steel . . . steel that minimizes the hazard of roll breakage in your plant.

BETHLEHEM STEEL
BETHLEHEM
VACUUM-DEGASSED
HARDENED STEEL
ROLL

LOOK FOR THIS "V" STAMP on the ends of the rolls you buy . . . "V" is for vacuum. You'll find this permanent identification on every Bethlehem roll from now on . . . because from now on Bethlehem will forge *only* from vacuum-degassed steel.





BETHLEHEM VACUUM-DEGASSED ROLLS are made for every application—cold-rolling steel sheet, strip, tinplate, and non-ferrous metals. Every roll meets your specifications exactly on size, shape, hardness, and finish.

Steel

For strength
. . . economy
. . . versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

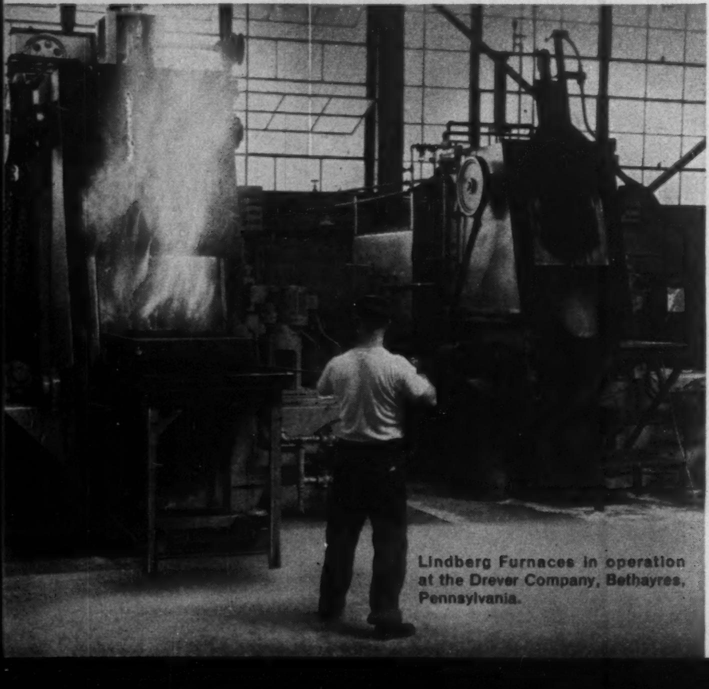
What HORACE DREVER has to say about Lindberg heat treating equipment

QUOTE from Mr. Drever's unsolicited letter to Lindberg Engineering Company

Mr. Horace Drever, internationally prominent in the industrial heating field, is a Past-President of the Furnace Manufacturers Association and President of Drever Company, furnace manufacturers and commercial heat treaters.

DREVER COMPANY

"For the past three and one-half years, we have been operating one of your Type 243618 GVRT Furnaces along with a 500 CFH Lindberg Hyen generator in our commercial heat treating division. We are extremely pleased, not only with the fine quality of work turned out by this equipment but also its relatively trouble-free operation. As evidence of our complete satisfaction we have ordered another Lindberg Furnace of this type."

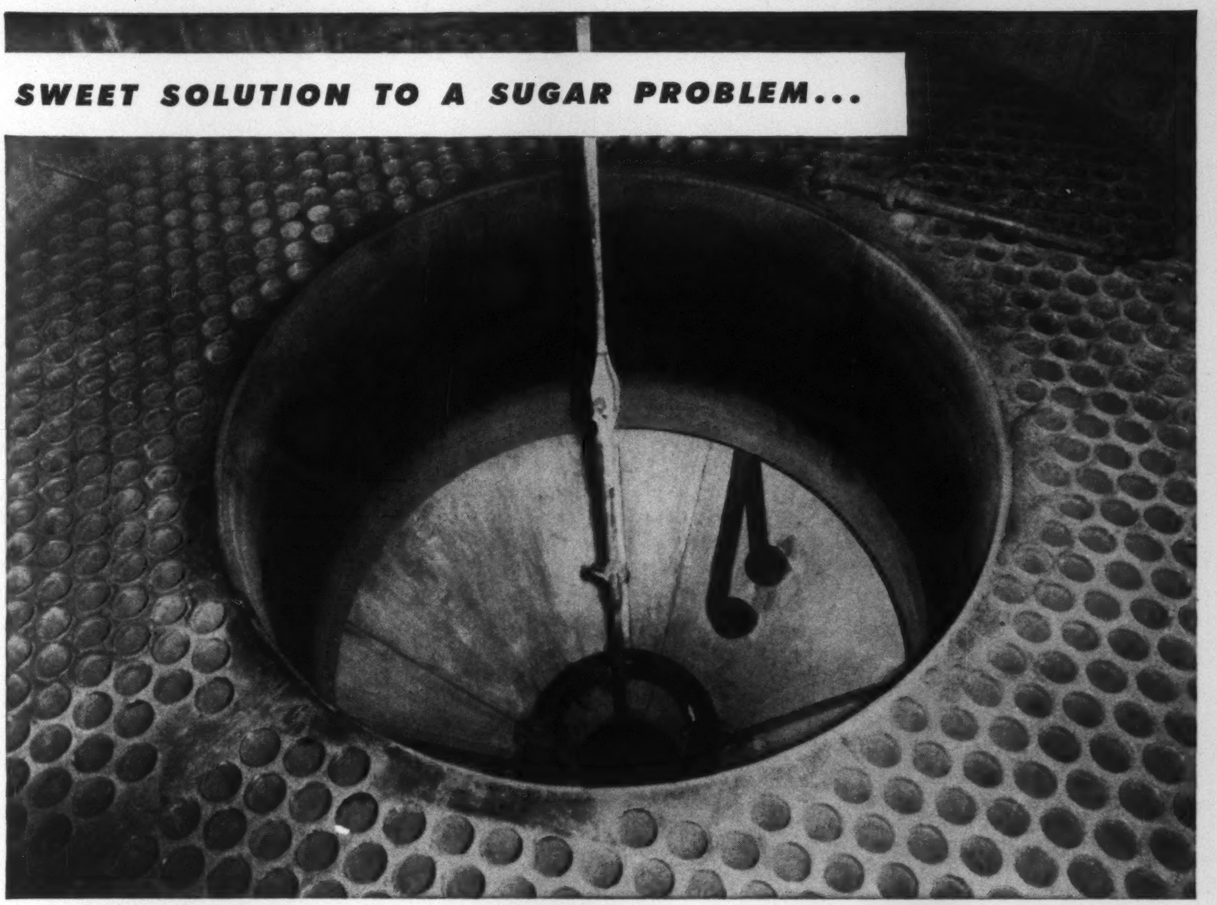


Lindberg Furnaces in operation at the Drever Company, Bethayres, Pennsylvania.

We are happy that Mr. Drever, a furnace manufacturer in his own right, originally chose Lindberg equipment for his heat treating plant and that its satisfactory service prompted an additional order. The second Lindberg Furnace is now in production at Drever Company, as the adjacent photo shows. Bless those satisfied customers! If you have a product or process in the metal or ceramic field requiring the application of heat you can depend on Lindberg's engineering and design know-how to provide exactly the right equipment to answer your need. Get in touch with your nearest Lindberg Field Representative (see classified phone book) or write direct to Lindberg Engineering Company, 2452 West Hubbard Street, Chicago 12. Illinois. Los Angeles plant: 11937 South Regentview Avenue, Downey, California. In Canada: Birlefco-Lindberg, Ltd., Toronto.

LINDBERG
heat for industry

SWEET SOLUTION TO A SUGAR PROBLEM...



Carpenter *full-finished stainless tubing*

- Calandria heating units, used in processing sugar, must resist both abrasion and corrosion. Externally, the tubing is attacked by ammonia and other steam-generated gases. Internally, the tubing gets an abrasive buffeting from crystal-bearing sugar syrup. Copper-Nickel Alloy tubing failed prematurely under this double attack.

The economical solution was Carpenter Type 304 Stainless Full-Finished Tubing. The result: Less equipment downtime, lower maintenance costs, increased production, and over-all economies in operation.

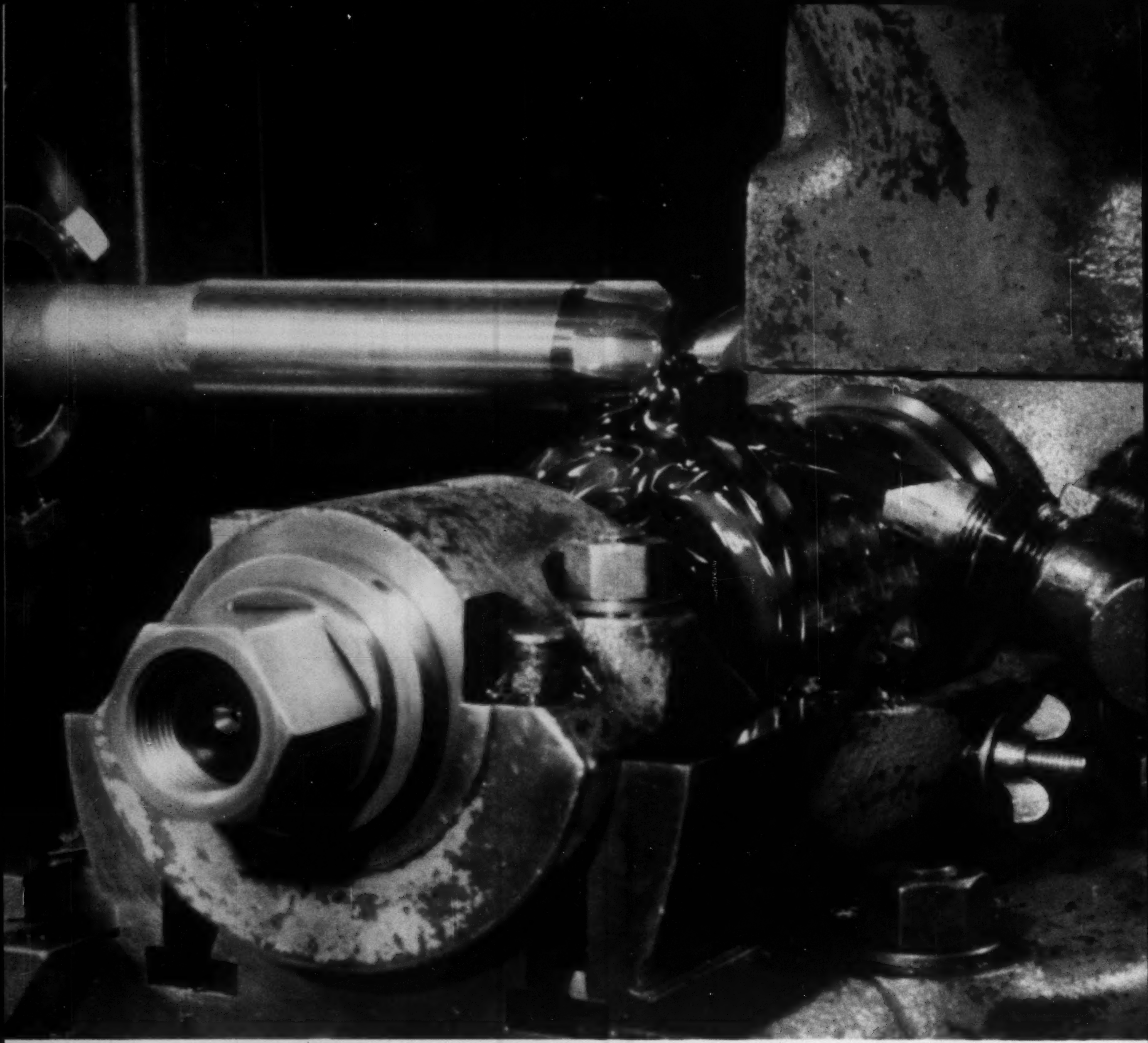
The consistent quality and greater uniformity of Carpenter Stainless Tubing were influential factors in its selection. Carpenter delivers these advantages plus the biggest extra of all . . . new, lower initial cost. For prompt service or delivery from mill stocks, call your Carpenter representative or write: The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

your master key
to cost-saving
corrosion control

the house of corrosion control

Carpenter

Stainless Tubing & Pipe



Baker Industrial Trucks switches to Gulfcut® 21C

GULF MAKES THINGS

After a series of comparative cutting oil tests, Otis Elevator Company, Baker Industrial Trucks Division, Cleveland, switched to Gulfcut 21C oil for hobbing their spline shafts, gears, axles, and other drive components. Here's why.

"Tests were carried out under actual work conditions," explains Plant General Manager Eugene Caldwell. "In one test, the workpiece was a 42-tooth spur gear forging of SAE 4142 steel, heat treated to Rc 20-27 hardness and cut on a Barber-Colman gear hobber. The oil we had been using gave us 10 to 12 pieces per hob shift. With Gulfcut 21C, we got 22 pieces.

"In another test, we hobbed Rc 23-34 steel spur gears on a Fellows machine. With our old cutting oil, we used to finish 10 to 12 gears per hob shift. With Gulfcut 21C we finished 20 pieces before regrinding."

Other production tests resulted in similar improvements. Says Mr. Caldwell: "By switching to Gulfcut 21C oil for these applications we've doubled tool life while maintaining close tolerances and fine finishes."

Mr. E. Caldwell, Plant Manager for Otis Elevator Company, Baker Industrial Trucks Division, Cleveland, explains Baker quality points to Thomas F. Irving, Gulf Sales Engineer.

◀ Splines being cut for a Baker lift truck axle. Cutting oil is Gulfcut 21C.

oil, doubles tool life . . .

RUN BETTER!

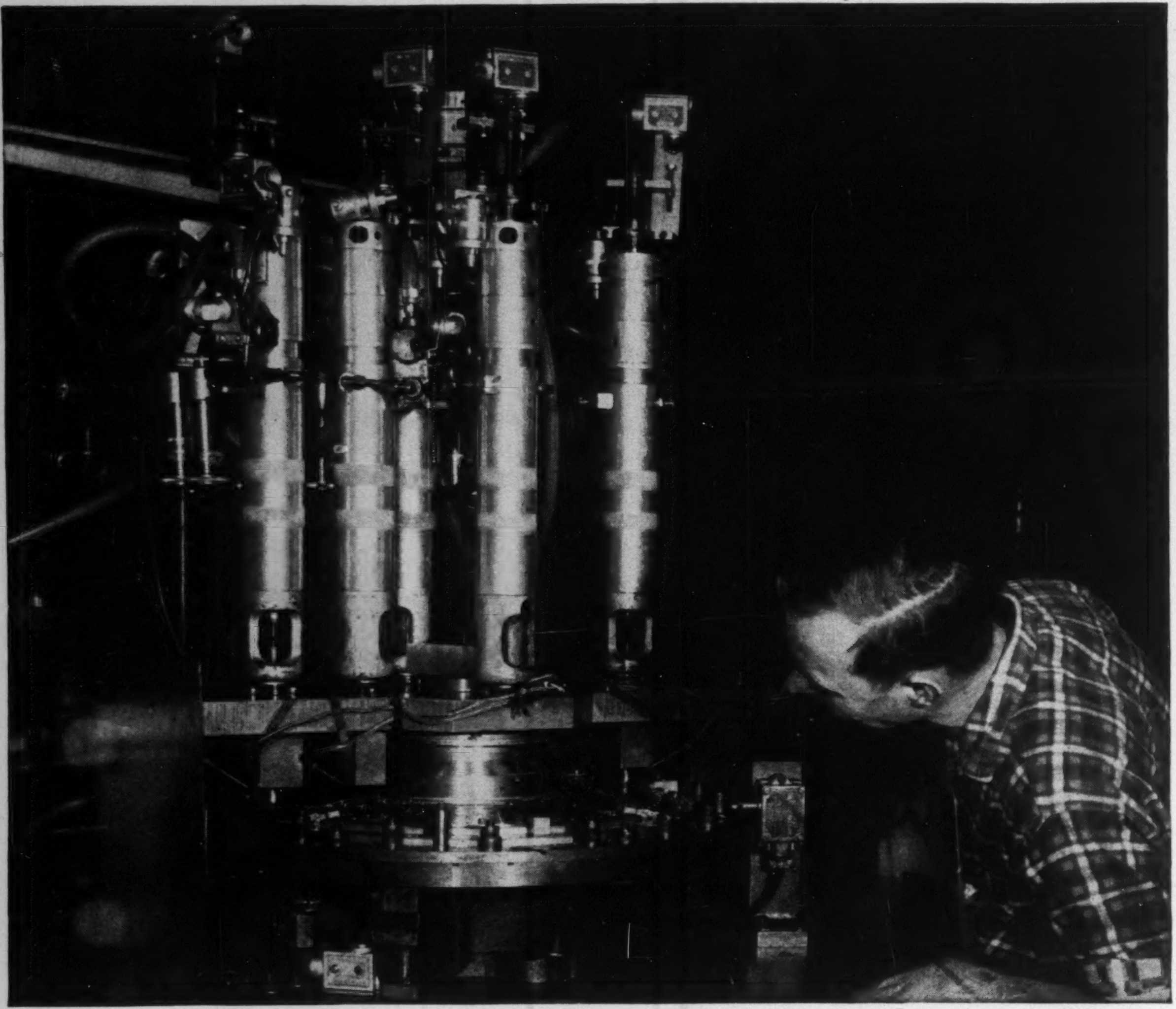
Gulfcut 21C is a sulfurized mineral oil. Its transparent light color permits close observation of the workpiece. It stands up well under tough machining conditions because it provides greater sulfur activity over the entire range of the cutting operation.

See for yourself how Gulf makes things run better! Call your Gulf Sales Engineer at your nearest Gulf office. It's his business to help. Meanwhile, write for your free copy of "Metal Machining with Cutting Fluids," the new 116-page handbook on their selection and use.

GULF OIL CORPORATION
Dept. DM, Gulf Building
Houston 1, Texas

GULF

SP-9865



Automatic drilling operation performed at Hupp Aviation Division, Hupp Corporation, Chicago, Illinois.

Airfeedrills® cut drilling time 88% on jet aircraft part

Time required for drilling 104 holes in a bearing support for a jet aircraft compressor was cut 88% when the manufacturer switched from other methods to five Gardner-Denver "Airfeedrills."

Three bolt circles were drilled at two different levels; 72, 8 and 24 holes were drilled in bolt circles 18⅞", 10.2" and 8.5" respectively. All holes in the material—AMS-6415—were drilled to close Air Force tolerances. A 36-station index table, plus automatic "Airfeedrill" controls, automated the entire operation.

VERSATILITY AND INTERCHANGEABILITY

This is just one more example of the versatility and interchangeability of Gardner-Denver "Airfeedrills." They're easily adapted to almost any drilling setup. You mount them as a drilling unit of 2, 20 or more spindles for automatic hole processing. Use one as a stationary drill mounted on an inexpensive fixture. As a portable drill, "Airfeedrill" hangs by its nose to a jig for precision drilling.

See for yourself how quickly and inexpensively you can automate *your* drilling operations . . . see your Gardner-Denver representative or write for Bulletin 92-1 on "Airfeedrill" specifications and applications.

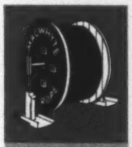
EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

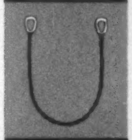
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

All-Americans for a Winning Materials Handling Team

These three championship performers give you a materials handling team that is unbeatable . . . All-American from the basic steel — through the drawing of the wire — to the finished wire rope product.



All-American No. 1 — Whyte Strand Wire Rope. Inspires other members of your team, brings out the best in them for maximum production at lowest cost. (Write for bulletin 6025.)



All-American No. 2 — The Atlas Sling for the safety spot — lifting and carrying all kinds of loads. Flexible, braided construction provides constant championship performance with unquestioned safety. (Write for bulletin 5308.)

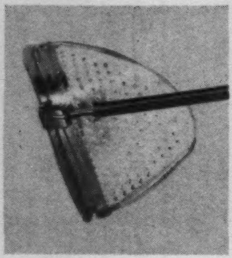
All-American No. 3 — Macwhyte Safe-Lock Cable Assemblies are a triple-threat specializing in uniformity, appearance, and agility . . . for manufactured products and equipment components requiring the positive performance of a custom-made cable assembly. (Write for bulletin 5601.)

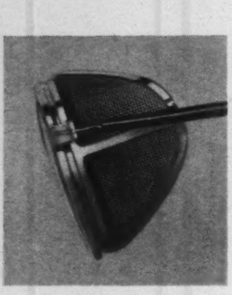
In addition to their outstanding performance on the materials handling and production fields, each one of these All-Americans lives up to these championship qualifications: *Dependability* that is the result of constant uniformity, maintained by rigid quality controls at every step of manufacture. *Experience* that pays off in high production scores . . . and game-winning play with other members of your equipment team specializing in American rules of the game. *Availability* guarantees the right player for every play, whether at the factory or the warehouse . . . backed up by expert engineering service. *These All-American products are completely made in the U. S. A.*

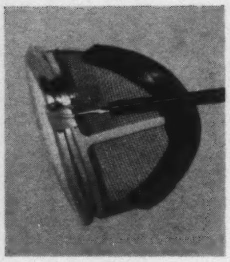
Start now to build up your All-American materials handling team. Your Macwhyte representative will be glad to coach your selections.

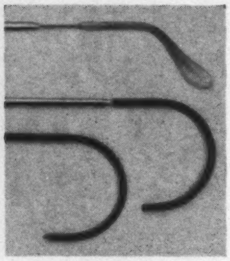
MACWHYTE Wire Rope COMPANY

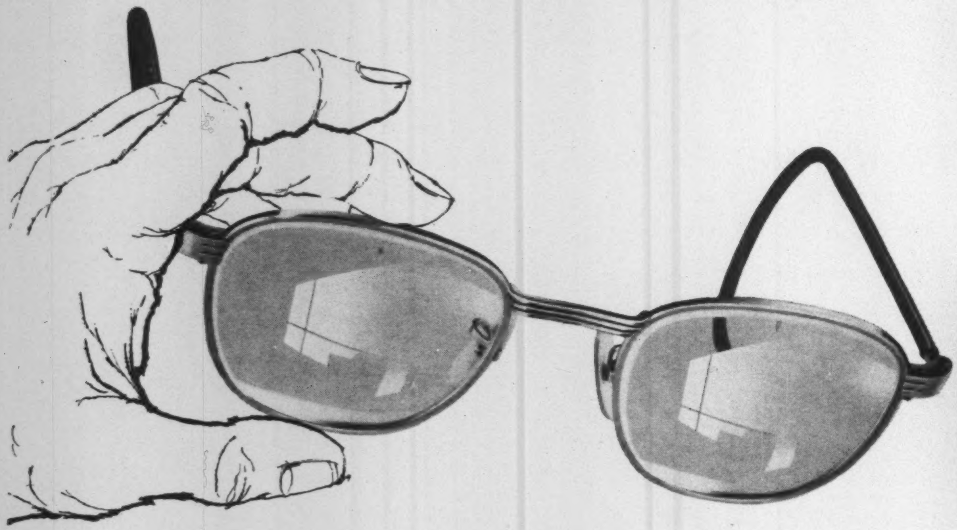
Acetate in clear or green.


Perforated acetate.

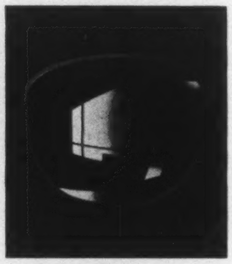

Wire mesh side shield.


Insulated mesh side shield.


Spatula or cable temples.



Bal-SAFE lenses in Ray-Ban.


Featherweight Enduron plastic.

ONE FRAME SERVES MANY EYE PROTECTION NEEDS

See how many ways this single sturdy metal safety frame can serve in your plant.

The M-70 features a unique expansion endpiece for quick, easy change-over of temples, side shields and lenses. The same front can be used both with and without side shields, and shields are held firmly as though a permanent part of the frame. This is a real factor in economy.

Engineered for maximum strength, this 18% nickel silver frame offers extreme comfort and—with its neatly engraved bridge and endpieces—imparts a distinct note of modern styling.

Perhaps no other B&L safety frame so lives up to its promise of protection *plus* economy *plus* worker acceptance. To see samples, call your B&L supplier, or write: Bausch & Lomb, 98509 Lomb Park, Rochester 2, New York.

BAUSCH & LOMB
SINCE 1853

Protection PLUS
Safety Products
protection + economy + worker acceptance

Throughout the steel industry, the Blaw-Knox name means exceptional service and the highest standards of performance. Behind this name are the engineering force and plant capacity necessary to meet steelmakers' most advanced requirements for modern automatic equipment. Blaw-Knox Company, 300 Sixth Avenue, Pittsburgh 22, Pa.

BLAW-KNOX

Rolling Mills and Processing Equipment for Shape Rolled Products

a Combination 46- x 114-inch Blooming-Slabbing Mill and 38- x 53- x 114-inch 4 high Plate Mill. **b** Wide Flange Beam and Structural Mill. **c** Merchant Mill.

Rolling Mills and Processing Equipment for Shape Rolled Products (Continued)

d Continuous Butt Weld Pipe Mill. **e** High Speed 2-roll Straightener in Cold Drawn Bar Line. **f** Roller Straightener for Hot Rolled Angles.

d

BLAW-KNOX

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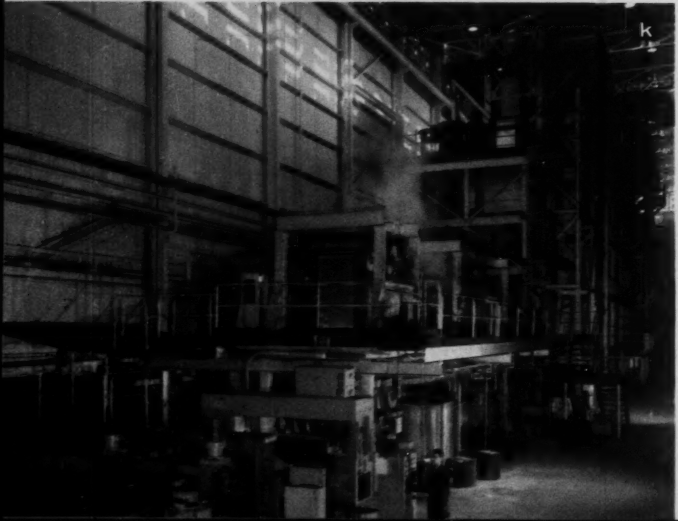

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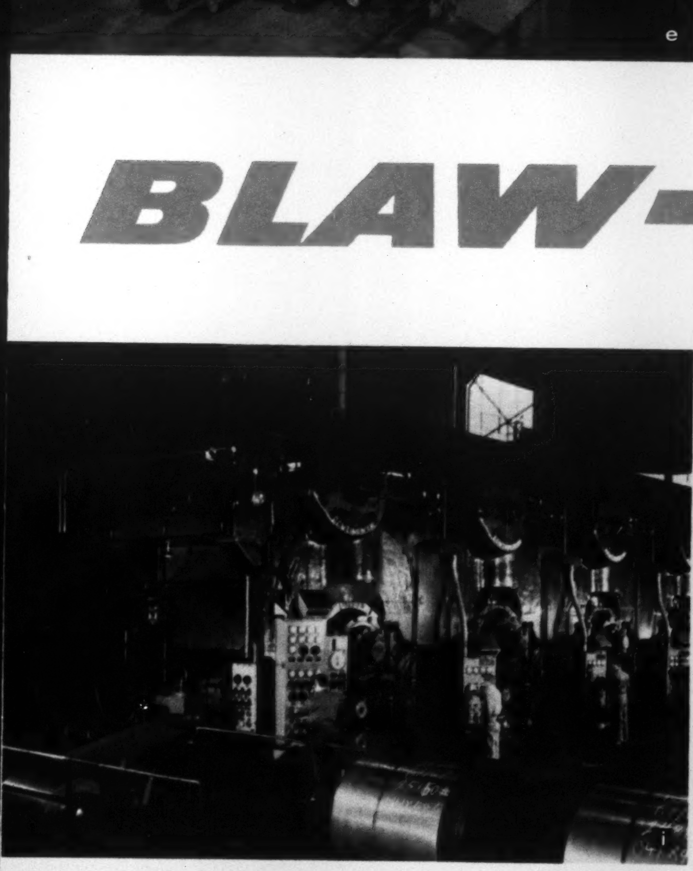
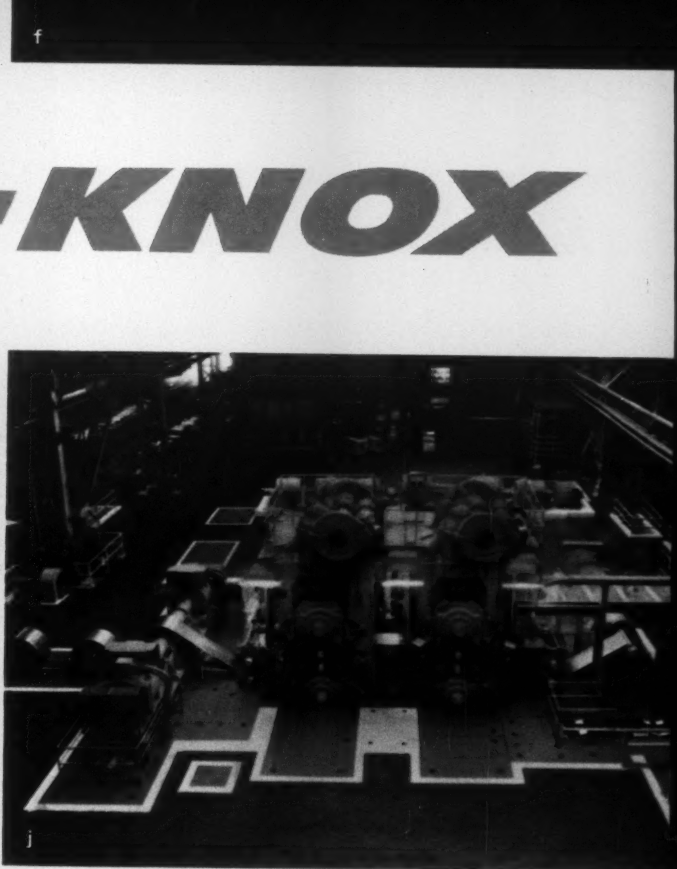
BLAW-KNOX





Rolling Mills and Processing Lines for Flat Rolled Products

g 46- x 90-inch Universal Slabbing Mill. **h** 56-inch Hot Strip Mill. **i** 60-inch Tandem Cold Strip Mill. **j** 19- and 53-inch x 48-inch Twin Temper Mill. **k** Continuous Annealing Line. **l** Electrolytic Tinning Line. **m** Continuous Galvanizing Line.

n **Iron, Alloy Iron, Steel and Alloy Steel Rolls.**

o **Foundry Products:** Peels, Slag Pots, Charging Boxes, Ingot and Charging Cars, Ladles, Trunnions and Rings, Blast Furnace Hoppers and Bells.

p **High Alloy Castings:** Radiant Tube Assemblies, Furnace Parts, Continuous Annealing, Conveyor, Feeder, Deflector and Zinc Rolls, and Heat Exchanger Elements.

q **Steel Plant Equipment:** Ladle Additions Feeders, Autopours,® Dolomite Machines, Water-cooled Doors, Frames, and Reversing Valves.

BLAW-KNOX

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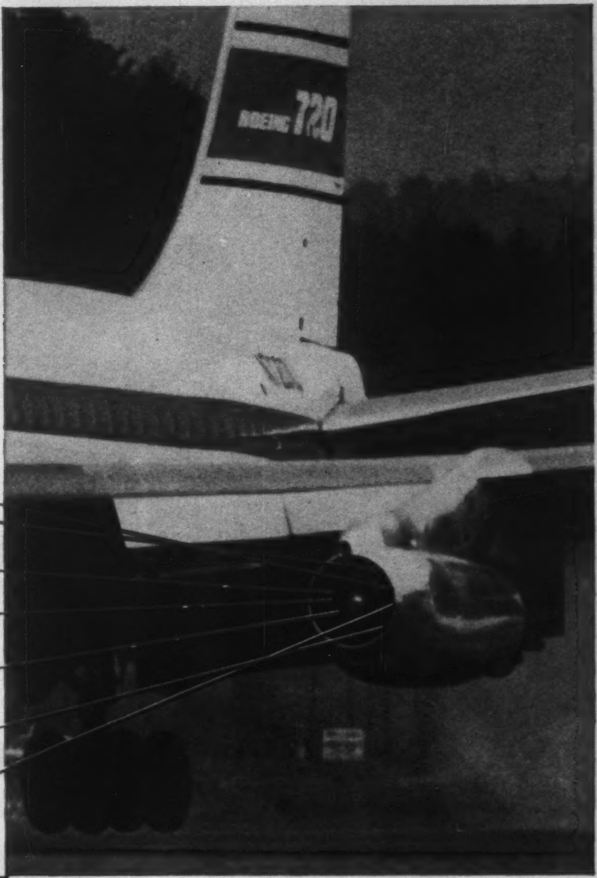
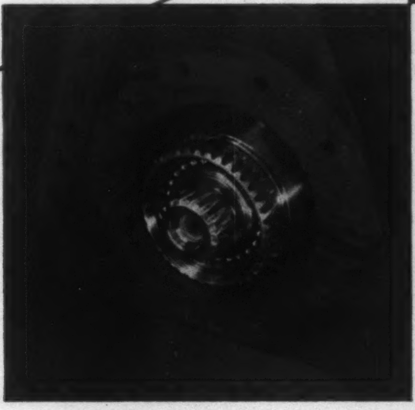


at the touchdown LATROBE'S VAC-ARC® steel goes to work



Thrust reverser bearing assemblies, made of Latrobe's Vac-Arc BG 41 Stainless, take compressive stresses of more than 600,000 psi and temperatures in excess of 800°F. as new Boeing 720 jetliner brakes to a stop. Bearings by Torrington Co.; Thrust Reversers by Rohr Aircraft; Jet Engines by Pratt & Whitney Aircraft.

VAC-ARC BG 41 "hot hardness" withstands critical breaking action of new Boeing 720

Through the use of thrust reversers and wheel brakes, the new Boeing 720 has been brought to a full stop within 2200 feet after runway touchdown—bringing high speed jet service to restricted runway facilities throughout the world.

The thrust reverser bearing assemblies, made of Latrobe's new Vac-Arc BG 41 Stainless (modified Type 440 C), withstand the critical stresses at elevated temperatures imposed by the braking action of reversing the jet engine thrust.

Here's another example of Latrobe Metalmasters meeting the challenge for super steels in the jet and missile age. Vac-Arc Steels (consumable electrode vacuum melted) continue to set new standards for cleanliness, homogeneity and high strength.

Do *you* have a high temperature-high strength specification problem? Call Latrobe!

Skillfully made in U. S. A. by

LATROBE Metalmasters

LATROBE STEEL COMPANY

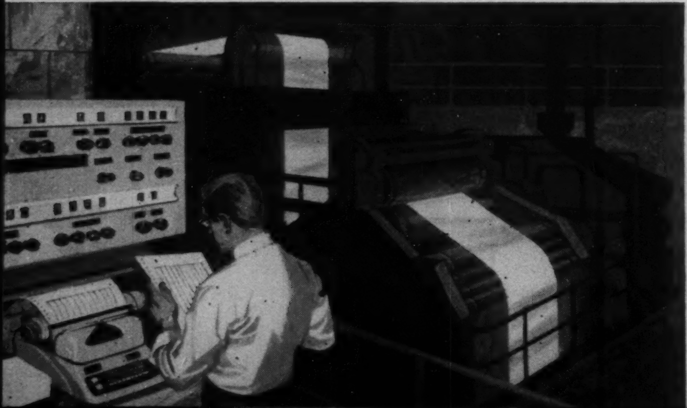
LATROBE, PENNSYLVANIA

Branch Offices and Steel Service Centers:

BOSTON • BUFFALO • CHICAGO • CLEVELAND • DAYTON • DETROIT
HARTFORD • LOS ANGELES • MIAMI • MILWAUKEE • NEW YORK
PHILADELPHIA • PITTSBURGH • SAN LEANDRO • TOLEDO

What a memory! How do you check quality and record it on coils of tinplate up to three miles long? New Cutler-Hammer sensing, memory device does it. It's the first of its kind anywhere.

What a view! Here's a radar picture of all runways at Idlewild Airport. It's so clear you could identify a horse two miles away! Another Cutler-Hammer development.



CH
CONTROL

What's new in control for automation?

An automatic warehouse that tells car bodies when to stop and go

Cutler-Hammer system directs car bodies to and from storage area for a major automobile manufacturer. The need was for a buffer storage area for car bodies between the assembly plant and the body building plant.

Before this storage area idea was conceived, car bodies went from the line of the body plant right to the line of the assembly plant. If one line had to shut down, the other did, too.

Cutler-Hammer systems control men developed the electrical control that sorts the car bodies coming from the body plant to one of eleven storage conveyors. Also, any body style can be taken off the conveyor and sent to the assembly line.

And, now? No shutdowns in one plant if the other is shut down temporarily. Any body style needed can be put on the assembly line. Couldn't be done before. So now, parts shortages affecting one body style don't affect production.

The conveyor system installed only last year is paying big dividends in reduced assembly line costs. As a result, several similar installations have been ordered.

The importance of an electrical control man. A Cutler-Hammer control man can bring wide experience to your automation planning table. He's handled many different products. He's worked with many different systems. With the proper control recommendations, many thousands of dollars can be saved.

The big change at Cutler-Hammer. You can see a change at Cutler-Hammer. We've prepared for the expected growth in the sixties with new, better products, new plant capacities, new engineering talent. If you're planning ahead, we'd like to talk to you. We could save you time and money in your automation planning. Contact the Cutler-Hammer sales office nearest you to see how.

Automation is more efficient when the control expert is called in early.

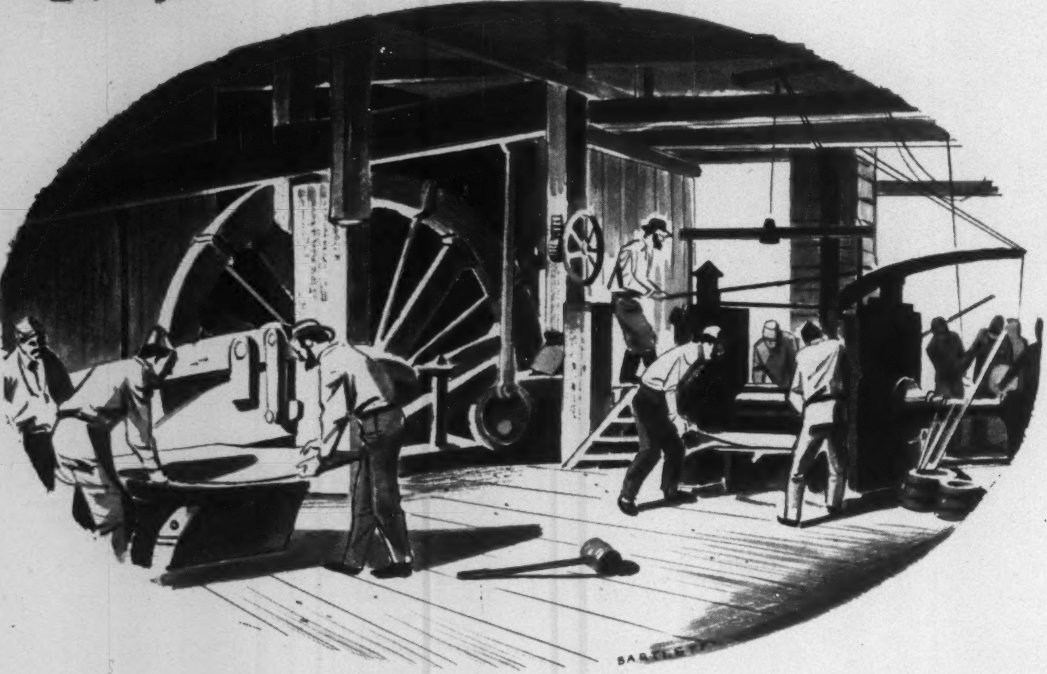
WHAT'S NEW? ASK...

CUTLER-HAMMER

CH
CONTROL

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler-Hammer International, C. A. Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.

AMERICAN ORIGINALS IN IRON AND STEEL



America's First Iron Plate Rolling Mill

Over one hundred and fifty years ago, the "Iron and Nail" factory that today is Lukens Steel Company was born on the banks of the Brandywine at Coatesville, Pennsylvania.

In that day, the production of plates was limited to less than 34 inches width in this water-driven mill. Today, Lukens Steel Company has the country's largest plate mill, producing rolled plates up to 195 inches in width.

Another famous first in the iron and steel industry is Baker's Magdolite, the original dead-burned dolomite. Ever since its early development, Magdolite has delivered more uniform ingots, in greater numbers and with less defective material. When you buy, be sure to specify Baker's Magdolite or Jebcolite. They are always 5 ways better . . . in composition, preparation, strength, economy and quality.

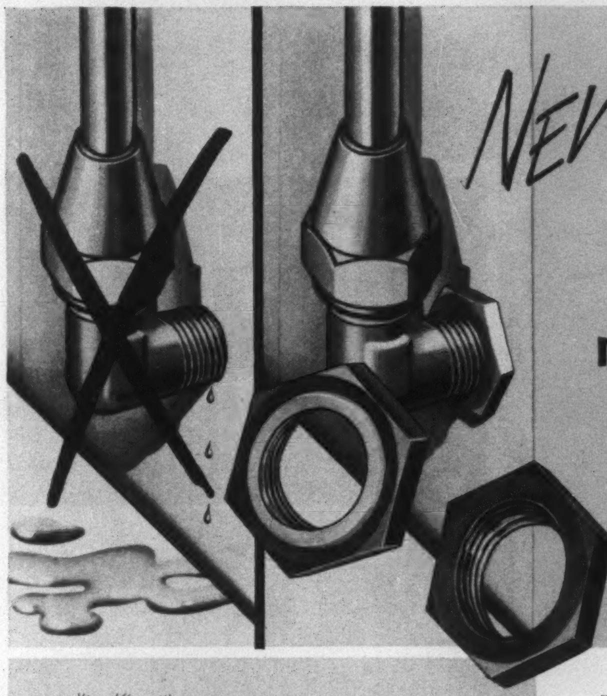
ANOTHER AMERICAN ORIGINAL

JEBCO
PRODUCTS
SINCE 1889

BAKER'S MAGDOLITE
The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO



NEW WEATHERHEAD

SEAL-NUT®

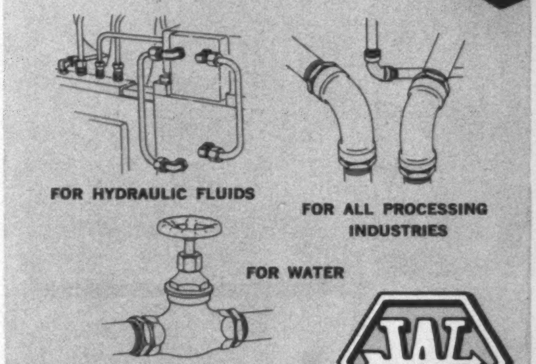
makes every pipe connection

LEAKPROOF!

***SAVE** - expensive maintenance costs*

***SAVE** - labor and downtime*

***SAVE** - valuable fluids*



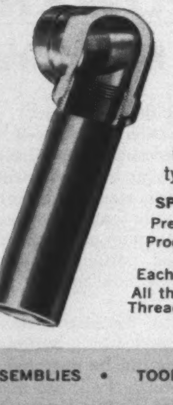
Eliminates leaks on all pipe threads—Dry Seal or standard. No pipe compound required. Quick, easy installations in cramped quarters where wrench clearance is limited.

Seal-Nuts are an economical substitute for straight thread "O" ring boss fittings using original female pipe ports. Seal-Nut gives you positive seal on directional fittings like tees and elbows without distorting mounting bosses or damaging expensive valves and pumps.

NEW FORGED STEEL

PIPE FITTINGS

Available in a wide range of sizes and styles, to meet most piping requirements.



Weatherhead steel pipe fittings are rugged, dependable for high pressure applications. They are precision machined from AISI 12L14 material to meet GMC dimensional standards. Weatherhead's exclusive ball-drilling process leaves no edges or sharp corners, eliminates turbulance and insures smooth, full flow. Corrosive resistant Weathercote finish is standard on these fittings, permits their use with all types of hydraulic fluids, water and air.

SPECIFICATIONS

Pressure Rated at 3,000 p.s.i. working pressure

Proof Tested: 15,000 p.s.i. in sizes up to 1¼"
10,000 p.s.i. in sizes 1½" and up

Each fitting is marked with its individual rating

All threads are American Standard Taper Pipe Threads — Dryseal (N.P.T.F.)

BRASS & STEEL FITTINGS • HOSE & ASSEMBLIES • TOOLS & ACCESSORIES

Write for your copy of our new General Industrial Catalog. Ask for Catalog C300.

THE WEATHERHEAD COMPANY • FORT WAYNE DIVISION
Dept. IA-9, 128 W. Washington Blvd., Fort Wayne, Ind.
In Canada: The Weatherhead Co., Ltd., St. Thomas, Ont.

Pick-up for Productivity...

Install

WAGNER *POWERED*

hydraulic brakes on busy cranes

Are shuddering, crane-wrenching stops . . . skid-by-the-spot stops . . . premature stops . . . reducing the productivity of your operation? Put an end to them. Equip your busy cranes with Wagner *Powered* Hydraulic Crane Bridge Brakes.

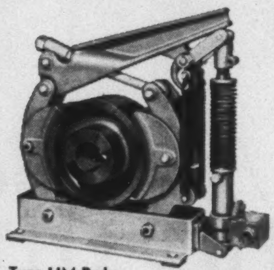
Wagner *Powered* Braking Systems reduce wear on equipment. Smooth power operation ends bridge motor plugging with its resultant damage to both motors and gears. Brakes don't drag and unnecessarily wear wheels and linings. You get safer, more efficient crane operation. Operators can stop cranes consistently and smoothly . . . productivity is increased, particularly in operations where frequent starts and stops are necessary, where close spotting is required, where heavy equipment is involved.

Your operators perform more efficiently, too, because there's far less fatigue. They can stop cranes with an easy touch of toe on a button while the heel rests comfortably on the floor. Several brakes can be operated from one station.

These power units can be added to your present Wagner Hydraulic System. Let your nearby Wagner Industrial Brake Application Engineer show you how easy, fast and economical such an installation can be. There are Wagner branches in 32 principal cities.

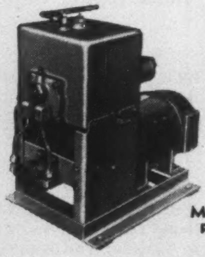
Wagner Electric Corporation
6403 Plymouth Ave., St. Louis 33, Missouri

SERVING 2 GREAT GROWTH INDUSTRIES—*ELECTRICAL • AUTOMOTIVE*



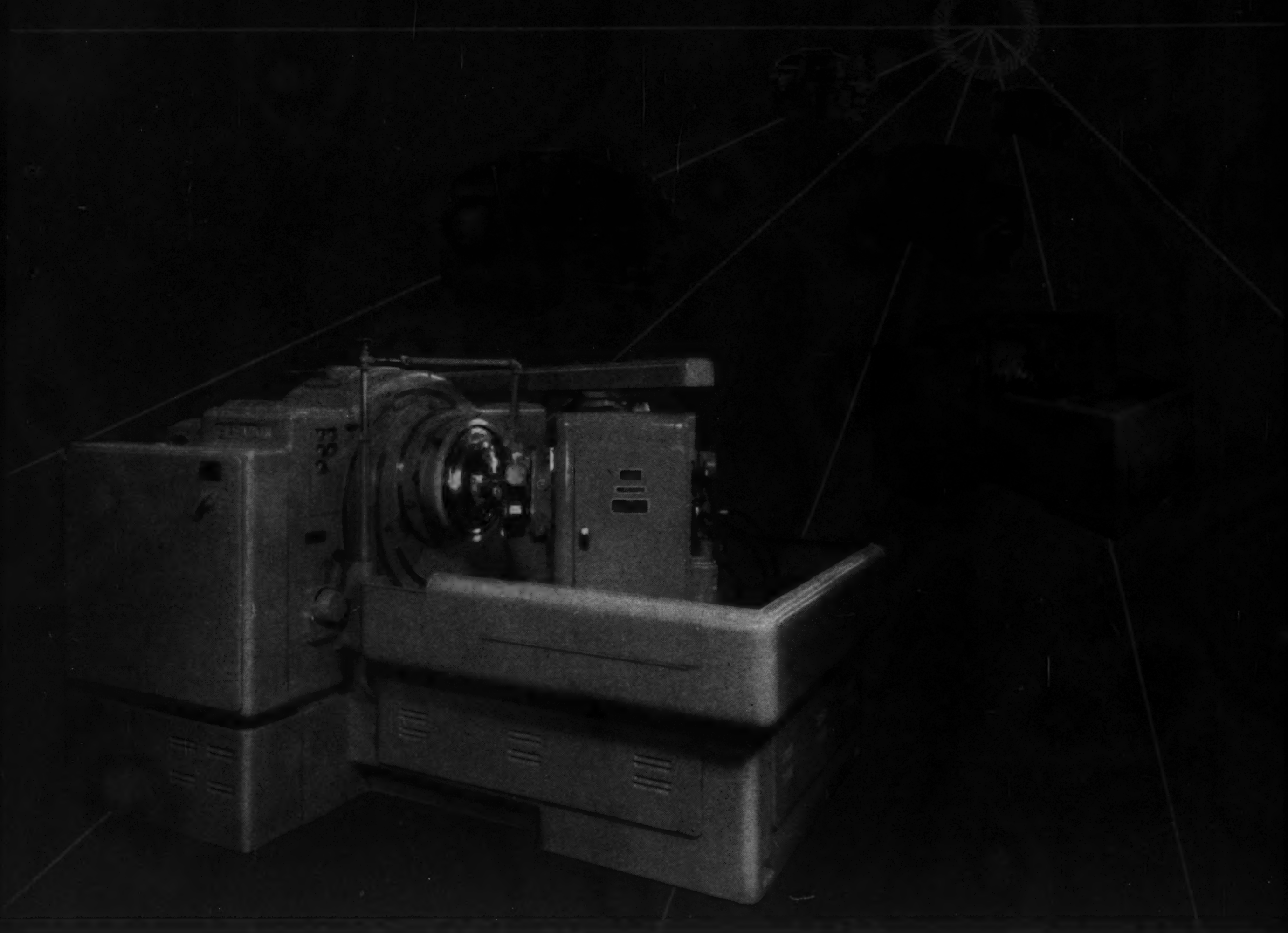
Type HM Brake

Tiptoe control valve



Motor-Driven power unit

W160-2



Now . . . one machine does the work of five!

For small production runs—here's *one* gear-cutting machine with the flexibility of *five!*

The Gleason No. 118 Hypoid Generator roughs and finishes both gears and pinions —using four cutting methods that formerly required a battery of five machines. When production requirements increase, you simply add other machines, the 118 becoming a specialized member of your production team.

1. Single-Cycle® Method. Using this method, you can cut nongenerated gears four to five times faster than previously possible on machines of this type. Cradle and work head are locked in position. The last rotation of the Single-Cycle Cutter finishes both sides of a tooth space. You cut the mating pinions on the same machine, using the conventional single-roll generating method.

2. Cyclex® Method. For certain applications you can use the extremely fast Cyclex Method on the No. 108 Generator. You cut nongenerated gears in one completing operation from the solid blank.

3. Generated Gears and Pinions. You can produce both gears and pinions on this machine with the generating method. Here, a relative rolling motion takes place between gear or pinion and the rotating cutter. Once the gear is chucked in the work head, the machine operation is entirely automatic.

4. Unitool* Method. If you want to cut small quantities of spiral bevel, Zerol® bevel, or hypoid gears with a minimum of tooling, you can use the Unitool Method. You cut both gears and pinions with a single cutter. This method is particularly useful for experimental gears for prototype work.

*Trademark

The No. 118 Hypoid Generator handles gears up to 18″ diameter at a 10:1 ratio, to a *maximum* coarseness of 2 DP. For production of smaller gears, the No. 108 Generator cuts gears up to 8½″ diameter at a 10:1 ratio and to 4 DP. A third model, the No. 28 Hypoid Generator, cuts gears up to 33″ diameter at a 10:1 ratio, 1½ DP.

For complete information, send for bulletins on all three machines.

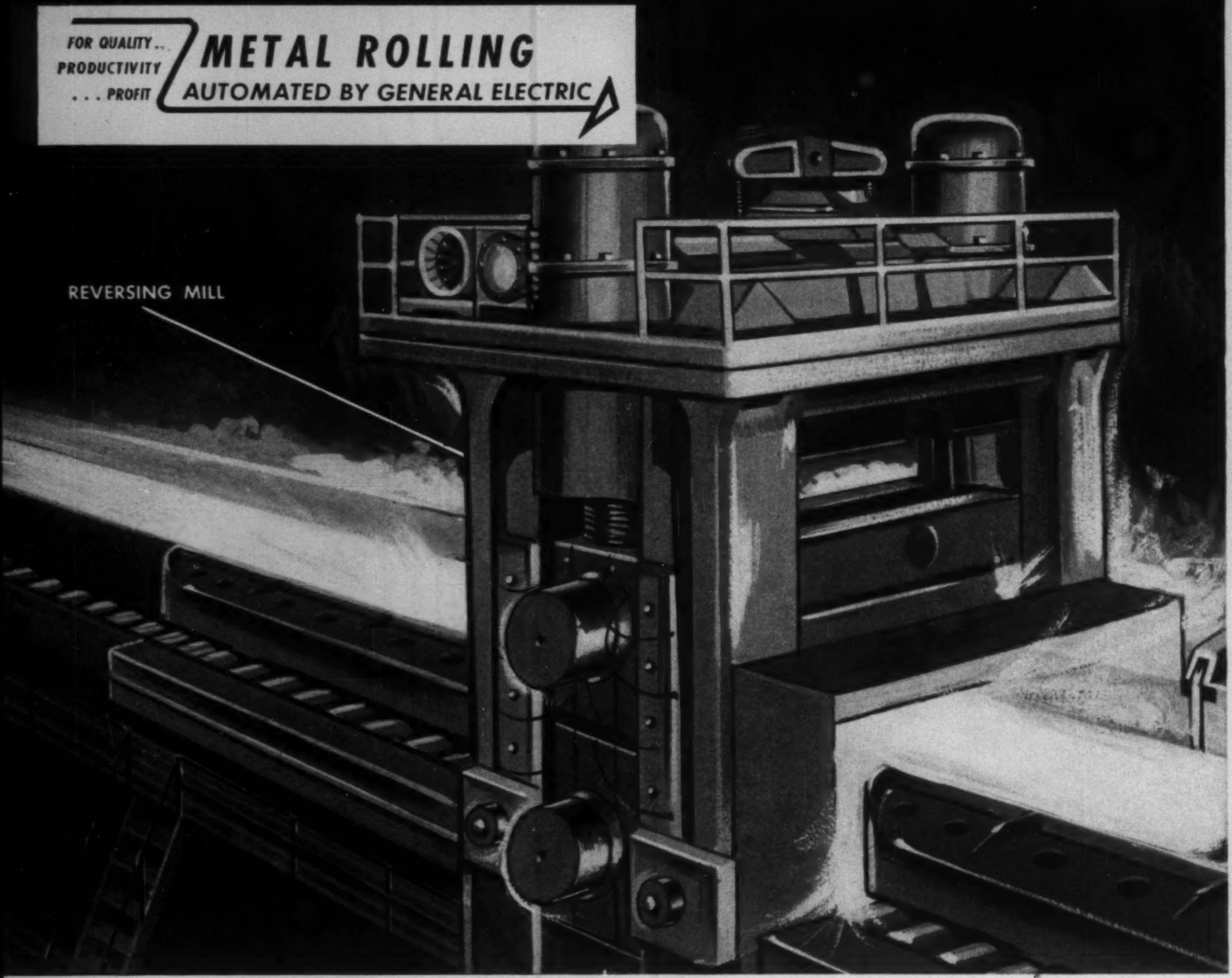
GLEASON WORKS

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

81

FOR QUALITY...
PRODUCTIVITY
... PROFIT

METAL ROLLING
AUTOMATED BY GENERAL ELECTRIC



A NEW CONTROL FOR REVERSING HOT MILLS

G-E program-control system operates

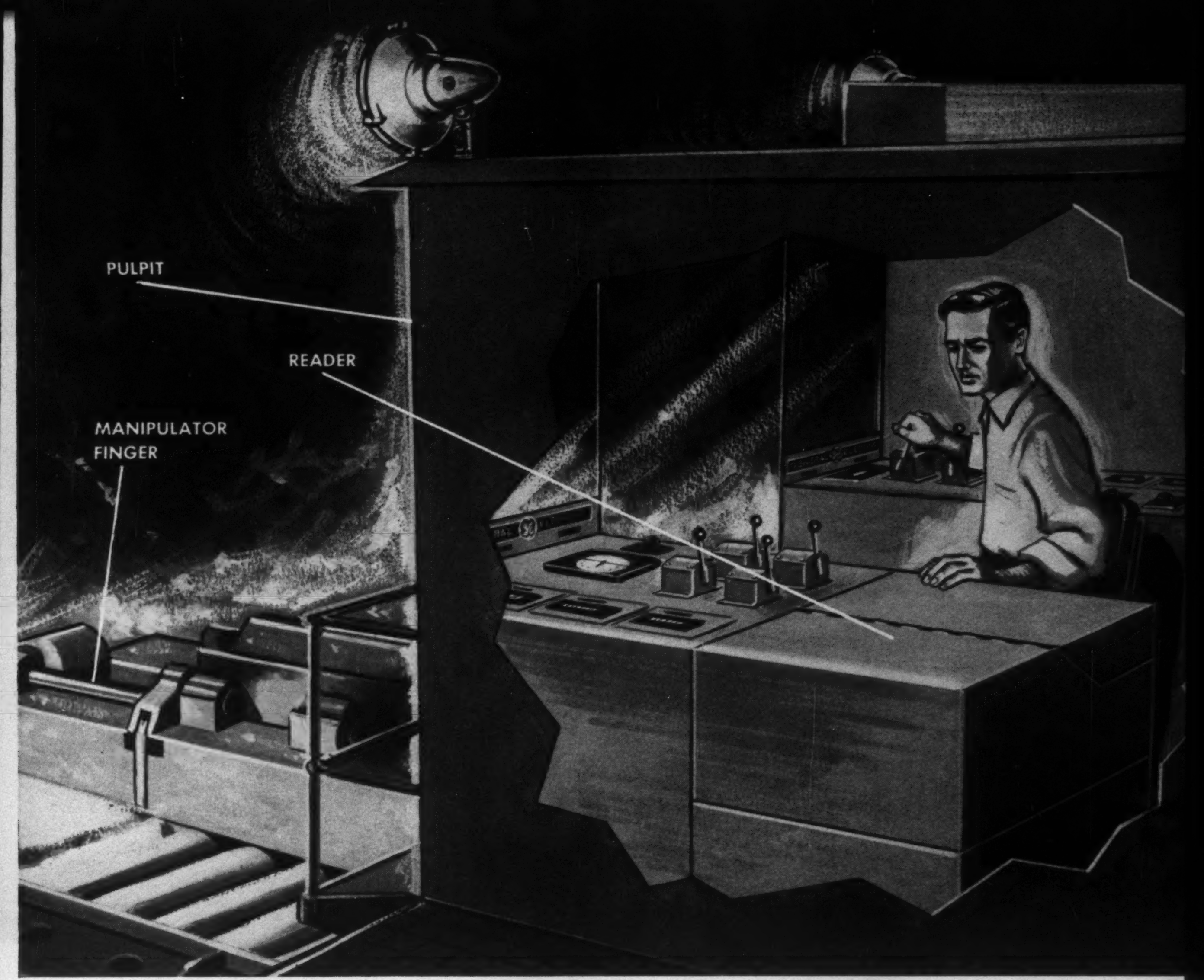
General Electric's new program control for reversing hot mills performs an entire rolling cycle—automatically. Increased yield per ingot, substantially improved product quality and reduced unit cost are outstanding advantages of this new control system.

HOW G-E PROGRAM CONTROL OPERATES

The entire rolling operation, from ingot entry to finished slab, is controlled automatically. A punched card or other memory device is used for data storage and to control the entire operating sequence.

The cards are punched to perform mill functions previously determined to be the most efficient for the equipment involved and the product desired. This controlling element is read by an industrial card reader, which sends impulses to the control circuit and on to the screwdown motors, mill table drives, and manipulator drives. The operator, seated in the pulpit, inserts the card into the reader, depresses a pushbutton, and then the control directs the entire operating sequence. The speed of the mill table, position of the rolls, manipulation of the piece, and sequencing operations for all passes are controlled automatically by the program control system.

Yield is increased—The General Electric program control schedules the mill tables to run at the most desirable and efficient speed. It also brings the rolls into the position calculated for maximum ingot reduction on each pass and turns the ingot at the exact time determined to produce highest slab quality. This precision control produces more finished slabs per turn than manually controlled mills.



entire rolling cycle — automatically

Quality is improved—Greater slab uniformity is obtained with G-E automatic program control. Consistent roll settings and mill speeds produce uniform slabs. This improved quality control also results in substantially less scrap.

Unit cost is reduced—Automatic programming produces finished slabs faster than ever before possible. Higher operating efficiency of machinery and faster equipment adjustment by automatic control cut production time—therein reducing unit cost.

Get all the facts on this new automatic control for steel mills. Contact your G-E Apparatus Sales Engineer today, or write to Sect. 785-10, General Electric Company, Schenectady 5, N. Y., for bulletin GEA-6869. Industry Control Department, Salem, Virginia.

Progress Is Our Most Important Product

GENERAL ELECTRIC

PLYMOUTH
LOCOMOTIVE

12 Ton Plymouth Locomotive operates 24 hours daily over 10 mile track system at this modern steel mill

PLYMOUTH lowers production costs by keeping steel in process on the move!

You get the reliability that returns greater profits when you put a Plymouth Locomotive to work—and the more continuous usage you give it, the more you benefit. There are many good reasons for that.

Plymouth Locomotives are built to handle big jobs with speed and efficiency around the clock—in all kinds of weather. Instant availability, low maintenance requirements, and faster switching, spotting and hauling performance reduces costs all around. Smooth starts and ease of control make Plymouth popular with the operators, reduce fatigue, and keep efficiency high.

We make both gasoline and Diesel Locomotives from 3 to 80 tons—either mechanical or Torqomotive (hydraulic torque-converter) drive—there's a Plymouth Locomotive that will fit your requirements perfectly.

"Saving time and money with our Torqomotive," says this user.

Within a few months after the Plymouth Diesel Torqomotive shown above was delivered, this Eastern steel manufacturer knew they had an outstanding locomotive. "Too early for actual cost figures," was the report, "but haulage by Plymouth is superior to previous methods. Our operator likes it better, too."

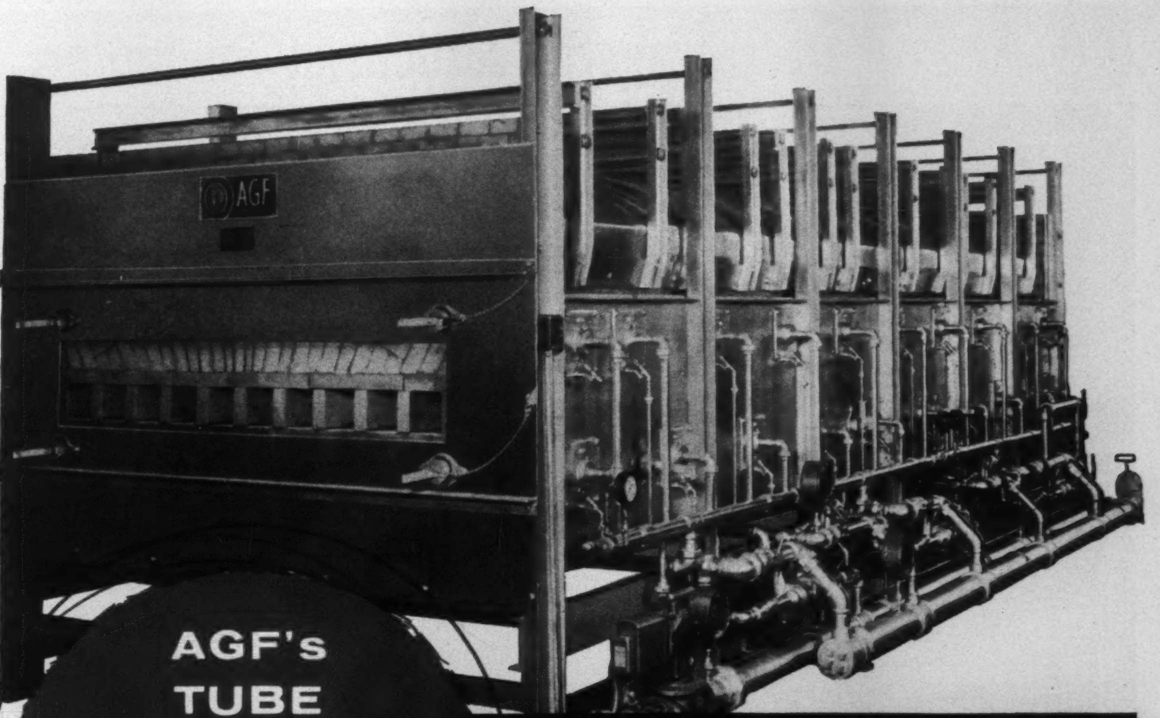
Send us a brief outline of your operation and we'll send you a recommendation promptly. Address: Plymouth Locomotive Works, The Fate-Root-Heath Company, Dept. A-2, Plymouth, Ohio.

PLYMOUTH® LOCOMOTIVES

WITH TORQOMOTIVE DRIVE

PLYMOUTH LOCOMOTIVES—
in PROGRESSIVE INDUSTRY
throughout the WORLD

ALSO BUILDERS OF
F-R-H CERAMIC MACHINERY



AGF's TUBE FURNACES

for WIRE, STRIP and POWDERS

ANNEALING	Steel, Stainless Brass, Copper, etc.
HARDENING	Steel and Stainless Wire and Strip
REDUCTION	Tungsten and Molybdenum Oxides
PATENTING	Steel Wire

AGF's single and multiple tube muffle furnaces, in a complete range of sizes, maintain completely uniform protective atmospheres within the alloy muffles.

Removable roof covers provide easy access to the heating chamber and muffle tubes for maintenance and inspection—greatly reducing maintenance "down time"

Advanced combustion system incorporates numerous specially designed AGF piloted combustion blocks of small heat input to provide TEMPERATURE UNIFORMITY which CANNOT BE OTHERWISE OBTAINED.

Multiplicity of burners and individualized control zone construction of heating chamber and combustion system permit EXACT regulation of any of the control zones at a desired temperature.

Send for your copy of AGF's new and complete catalog of heat-treating equipment and accessories, as well as for detailed information concerning specific problems and equipment.

AMERICAN GAS FURNACE CO.

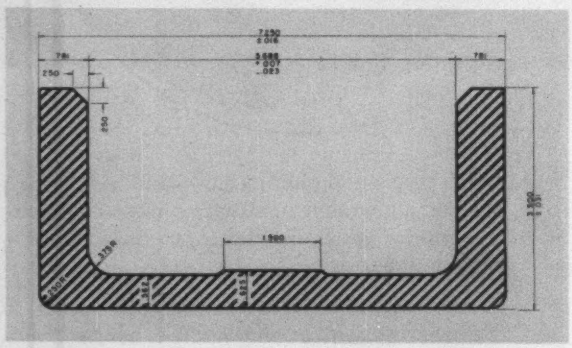
1004 LAFAYETTE STREET • ELIZABETH 4, N.J.

CONNORS special sections at Towmotor...

TOWMOTOR
TOWMOTOR
TOWMOTOR
TOW

"We increased our production efficiency 25% with Connors Special Sections," says Mr. Richard S. Wentz, Vice President, Towmotor Corporation

"By working with Connors Special Sections Engineers, we have gone a long way in improvements in product design and styling," Mr. Wentz says. "The flexibility of the Connors mill has enabled our engineers to design sections which in the past were considered impractical from a mill standpoint, yet highly desirable to our engineering and production departments."



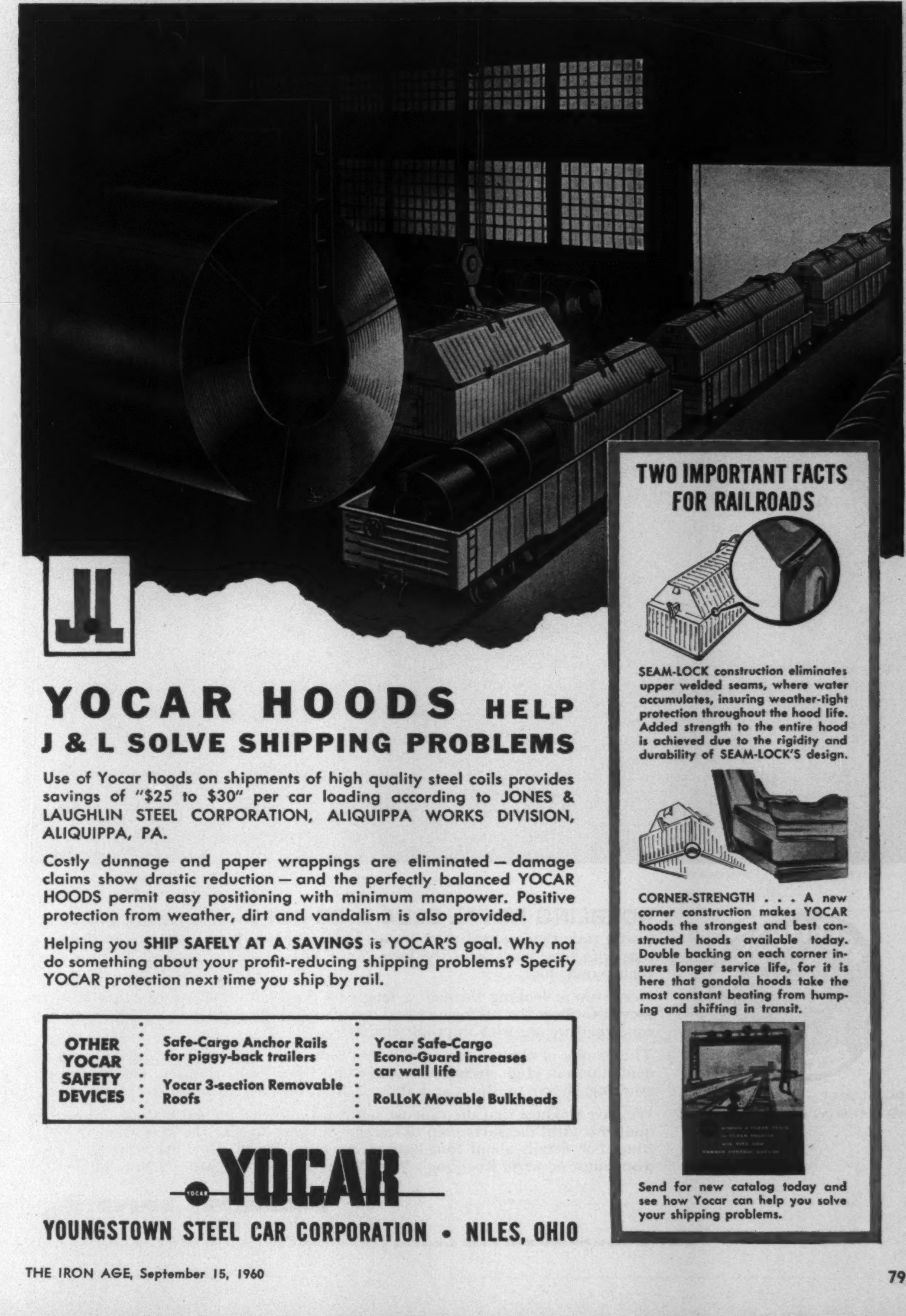
Towmotor had been machining the height, the inside face and the 45 degree chamfer on their mast channel section. These operations were eliminated by a special section rolled by Connors providing the dimensions required as well as other desirable features.

Let Connors Special Sections work for you.

For illustrated brochure or consultation write or call Connors — Specialists in Special Sections
CONNORS STEEL DIVISION, P. O. BOX 118A, HUNTINGTON, WEST VIRGINIA • PHONE JAckson 9-7171

CONNORS STEEL DIVISION PORTER ***H.K. PORTER COMPANY, INC.***

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.



YOCAR HOODS HELP J & L SOLVE SHIPPING PROBLEMS

Use of Yocar hoods on shipments of high quality steel coils provides savings of "$25 to $30" per car loading according to JONES & LAUGHLIN STEEL CORPORATION, ALIQUIPPA WORKS DIVISION, ALIQUIPPA, PA.

Costly dunnage and paper wrappings are eliminated — damage claims show drastic reduction — and the perfectly balanced YOCAR HOODS permit easy positioning with minimum manpower. Positive protection from weather, dirt and vandalism is also provided.

Helping you **SHIP SAFELY AT A SAVINGS** is YOCAR'S goal. Why not do something about your profit-reducing shipping problems? Specify YOCAR protection next time you ship by rail.

OTHER YOCAR SAFETY DEVICES	Safe-Cargo Anchor Rails for piggy-back trailers Yocar 3-section Removable Roofs	Yocar Safe-Cargo Econo-Guard increases car wall life RoLLoK Movable Bulkheads

YOCAR

YOUNGSTOWN STEEL CAR CORPORATION • NILES, OHIO

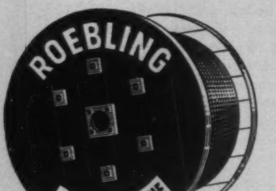
TWO IMPORTANT FACTS FOR RAILROADS

SEAM-LOCK construction eliminates upper welded seams, where water accumulates, insuring weather-tight protection throughout the hood life. Added strength to the entire hood is achieved due to the rigidity and durability of SEAM-LOCK'S design.

CORNER-STRENGTH . . . A new corner construction makes YOCAR hoods the strongest and best constructed hoods available today. Double backing on each corner insures longer service life, for it is here that gondola hoods take the most constant beating from humping and shifting in transit.

Send for new catalog today and see how Yocar can help you solve your shipping problems.

THE INSIDE STORY



ROYAL BLUE—*we put a lot of work into it—You get a lot of work out of it.*

ROEBLING ROYAL BLUE WIRE ROPE This is rather a long view of a wire rope that's a real work horse. Time and tests have taught us at Roebling that wire rope users *want* the long view. What else, they say, are they spending their money for?

Here, you're looking through a length of Royal Blue whose core has been removed to show the uniformity and symmetry of the rope structure. You see how concerned we are with internal security.

This is one of the reasons why Royal Blue lives up to the day-to-day demands made upon it. High stresses and unavoidable overloads, abrasion, fatigue, impact, crushing, sheave pressures and abusive drum-winding, to name the major ones.

We have to know that the rope we build will do what we sell it to do. Numerous quality-control measures help us—as they do you—to take the long view of Royal Blue. For details about long-lasting Roebling Royal Blue, ask your wire rope distributor or write Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities • John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

Don't bust a blood vessel

Use the New TELECRANE®

FM Carrier Communication System

If it's necessary to whistle, shout or wave arms to communicate with crane and equipment operators in your plant, you're flirting with accidents, encouraging work lags, and inefficient operations. You can avoid them all with a system of direct, two-way voice communications.

Union Switch & Signal offers this system at a surprising low cost. The basic equipment includes transmitter-receiver units, loudspeakers, and microphones, and there is a full line of accessories to provide complete flexibility in design. Your own plant electricians can install the system—it uses existing electrical circuits. The system is easy to use—no special training needed. There's no transmission noise or outside interference—voice comes through loud and clear, and there's lots of audio power for your noisiest location.

Union Switch & Signal Carrier Type communication systems are used extensively in steel, railroad, and mining operations. The equipment is rugged and dependable, and uses the very latest and best developments in electronic circuitry. Don't miss this chance to improve your operation. Check the coupon.

Visit our Booth 487 at the Iron & Steel Exposition,
Cleveland Auditorium, Sept. 27-30, 1960

"Pioneers in Push-Button Science"

UNION SWITCH & SIGNAL
DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY
PITTSBURGH 18, PENNSYLVANIA

Union Switch & Signal
Division of Westinghouse Air Brake Company
Pittsburgh 18, Pennsylvania

☐ Please send literature about Telecrane

☐ Please have representative call

Name______________________________

Title______________________________

Company______________________________

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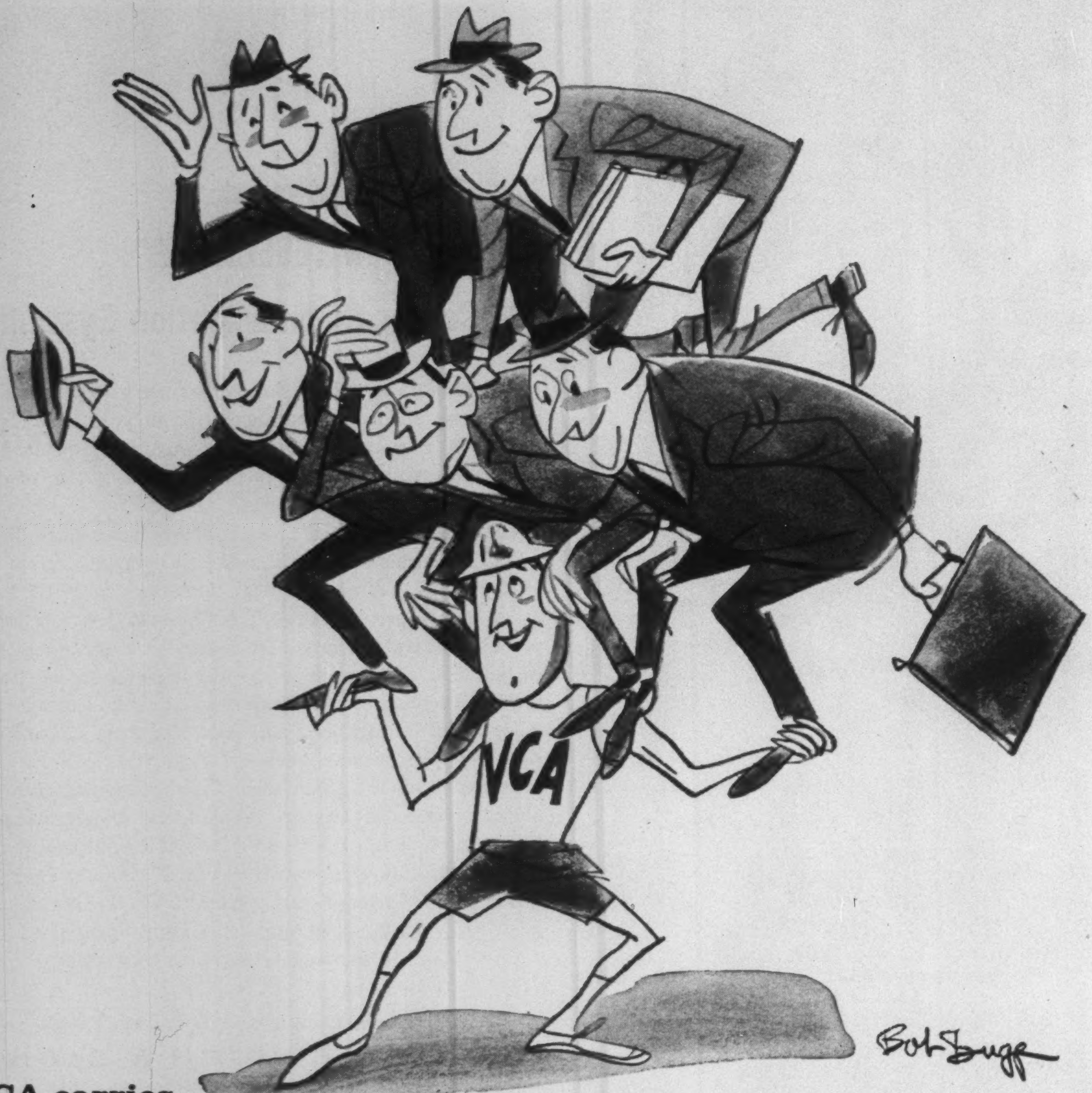
City________________Zone____State__________



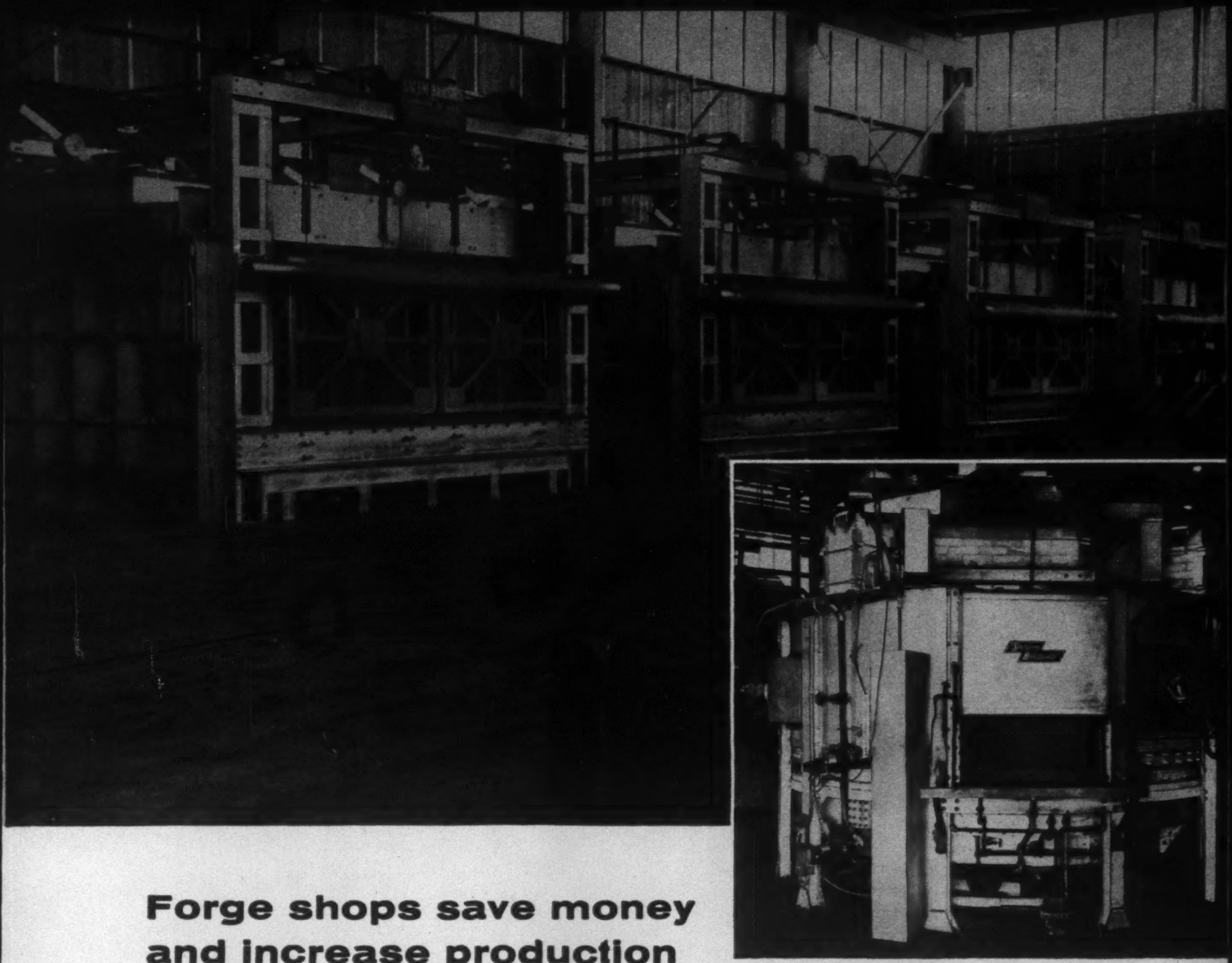
VCA carries a complete line of distributors, too!

A full line of ferroalloys isn't all that Vanadium Corporation offers. Consider, for a moment, VCA's full line of *Distributors.* They're centered for service at strategic locations, to meet your needs completely and efficiently from local warehouses. When you insist on Vancoram Products, you're settling for nothing less than the best. And the best possible service comes with them! Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N. Y. • Chicago • Cleveland • Detroit • Pittsburgh.

Vancoram Products are distributed by:

Pacific Metals Co., Ltd.—San Francisco, Los Angeles, San Diego, Salt Lake City, Phoenix. **Steel Sales Corp.**—Chicago, Detroit, Milwaukee, Indianapolis, Grand Rapids, Minneapolis, St. Louis, Kansas City, Mo. **J. M. Tull Metal & Supply Company, Inc.**—Atlanta, Ga.; Jacksonville, Miami, Tampa, Fla.; Birmingham, Ala.; Greenville, S. C. **Whitehead Metals, Inc.**—New York City, Buffalo, Syracuse, Albany, Schenectady, Rochester, Philadelphia, Lancaster, Allentown, Baltimore, Harrison, N. J.; Windsor, Conn.; Cambridge, Mass.; Richmond, Va. **Williams & Company, Inc.**—Pittsburgh, Cleveland, Cincinnati, Columbus, Toledo, Louisville.

VANADIUM
CORPORATION OF AMERICA
Producers of alloys, metals and chemicals



Forge shops save money and increase production with these Salem-Brosius furnaces

Salem-Brosius furnaces are favorites in shops that forge stainless steels, titanium, zirconium, aluminum, and many of the refractory alloys used in jet engines and missiles, as well as the full range of carbon steels generally employed. The battery of batch furnaces above is now in continuous operation in the plant of one of the nation's outstanding forgers of newer alloys. The rotary hearth furnace below heats bar stock for closed-die automotive forgings.

Forge shop operators specify Salem-Brosius furnaces because they are built for long service life with common-sense structural, refractory, and mechanical characteristics. Designed for manual or automatic charge and discharge, rotaries such as this offer efficient, low-cost heating. They can be manually or automatically controlled, and offer assurance of fast and uniform output at high speed in a minimum of floor space.

Whether you require these or any other type of heating or heat-treating furnaces, Salem-Brosius can build them. Call us today.

Salem-Brosius, Inc.

PITTSBURGH, PENNSYLVANIA

Salem-Brosius (Canada) Limited, Rexdale, Ontario • Salem-Brosius (England) Limited, London and Milford, England
Salem-Brosius (France) S.A., Paris, France • Salem-Brosius (Luxembourg) S.A. • Alloy Manufacturing Corp., Pittsburgh, Pa. • R. H. Freitag Manufacturing Div., Akron, Ohio • General Ionics Corp., Pittsburgh, Pa.

WEIRTON STEEL COMPANY

12 B&W IFB lined single stack annealing covers in use in the strip annealing department of Weirton Steel Company, a division of National Steel Corporation, at Weirton, West Virginia.

uses lightweight B&W Insulating Firebrick for single stack annealing covers.

These 12 covers, lined with B&W K-20 Insulating Firebrick, have been in service more than two years in the annealing of low and high carbon strip from Weirton's 54″ strip mill. Identical in construction, the covers are over 17 feet from base to skew and over 10 feet in diameter. The domes are of 9″ K-20 IFB construction.

The K-20 is one of B&W's *lightweight* Insulating Firebrick. In fact, B&W K-20 IFB are at least a third of a pound lighter than other 2000 F insulating firebrick. This means savings in the overall weight of portable covers. Additional savings in fuel consumption and cycle time are possible because lightweight B&W IFB store and conduct less heat. Heat is kept in the furnace, not in the lining.

This application points out advantages of light weight in insulating firebrick constructions. And B&W makes the *lightest* weight insulating firebrick. Consult your B&W Refractories Representative for information on how you can profit with lightweight B&W IFB.

Bulletin R-2-H available on request.

B&W

THE BABCOCK & WILCOX COMPANY

REFRACTORIES DIVISION

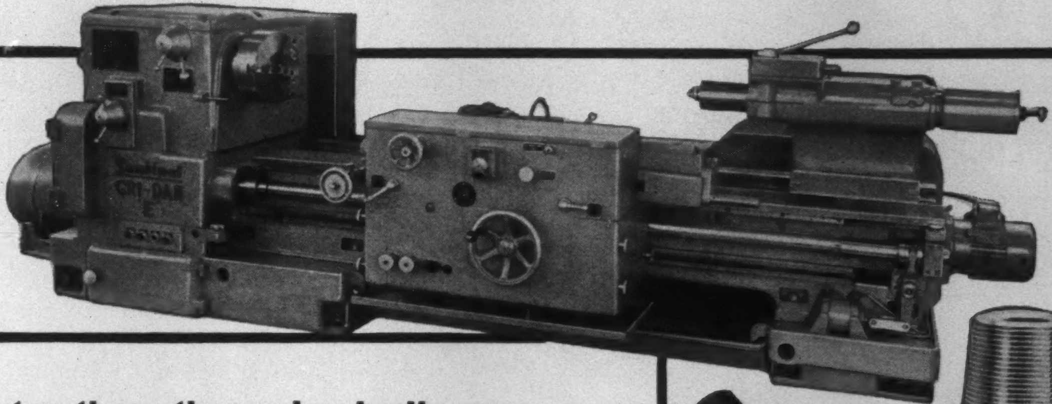
R-617

B&W Firebrick, Insulating Firebrick, and Refractory Castables, Plastics, Ramming Mixes, Mortars, and Ceramic Fiber.

CRI-DAN

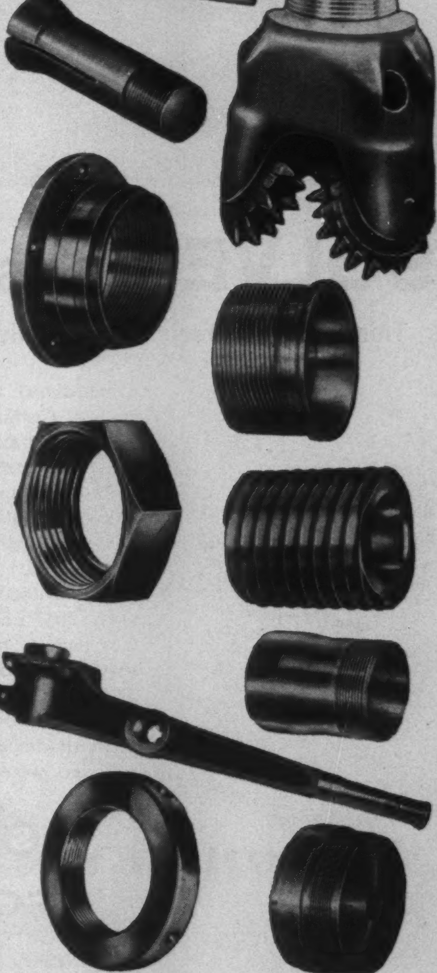
(Semi-Automatic Single Point)

THREADING LATHES...



faster than thread grinding or milling...handles toughest jobs on hardest materials at less cost--distributed by

GISHOLT



Widely used throughout Europe and rapidly gaining favor in the U.S.A., CRI-DAN High-Speed Threading Lathes offer outstanding advantages on a wide variety of threading work. Using single-point carbide tools and positive, cam-controlled movements, CRI-DAN provides very accurate lead and thread form on all types of internal and external threads, including multiple-start, coarse, fine, left- or right-hand, parallel or taper, with metric or inch pitches. Highest production, accuracy and fine finish are assured on even the most difficult materials.

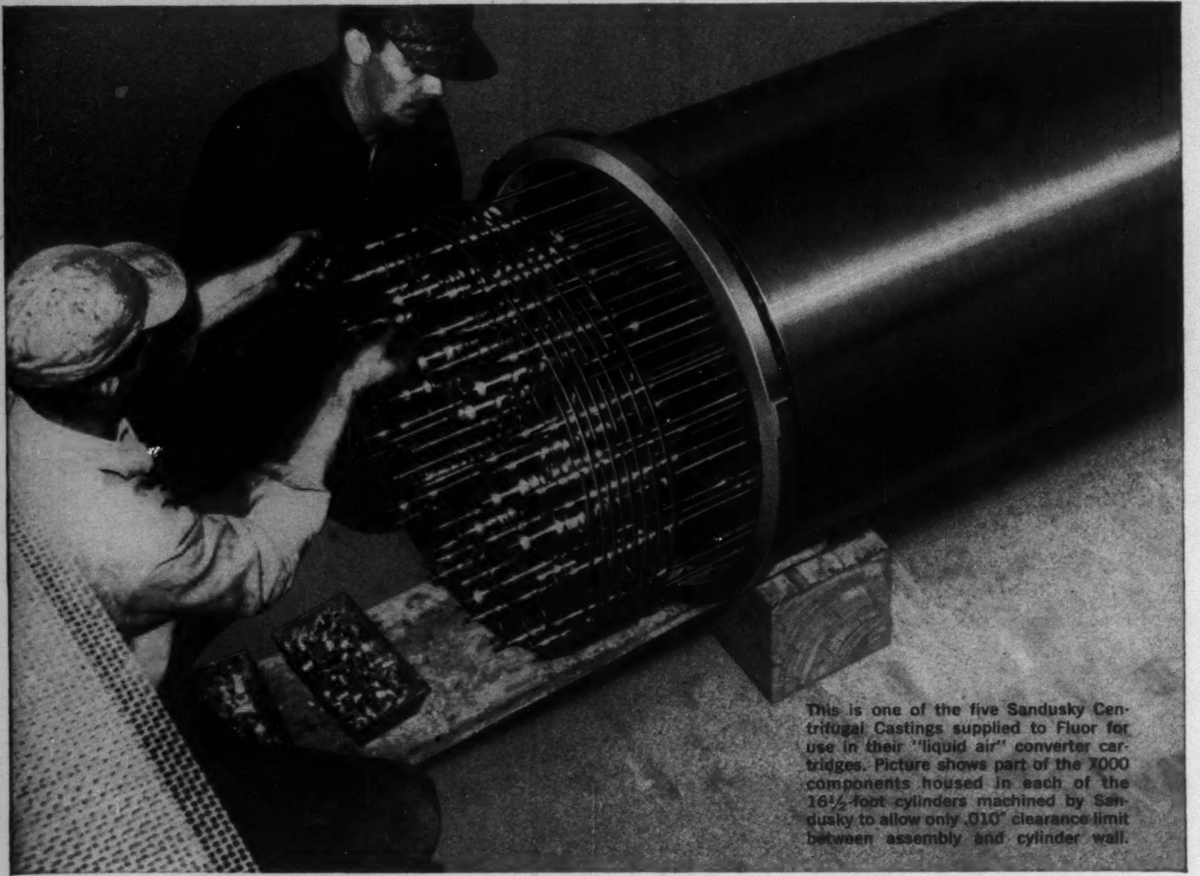
With simple operation and 15 minute change-over, CRI-DAN is an extremely versatile machine capable of handling an amazing range of components at high production rates. Single-point carbide tools, easily resharpened or replaced, cut tooling costs to a minimum.

Two models are available with a full complement of accessories to meet your needs. Ask your Gisholt Representative for full details or write

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin

Investigate Gisholt's Extended Payment and Leasing Plans

Turret Lathes • Automatic Lathes • Balancers • Superfinishers
Threading Lathes



This is one of the five Sandusky Centrifugal Castings supplied to Fluor for use in their "liquid air" converter cartridges. Picture shows part of the 7000 components housed in each of the 16½-foot cylinders machined by Sandusky to allow only .010" clearance limit between assembly and cylinder wall.

SOLVED by Sandusky Centrifugal Castings:

This difficult precision-cost-delivery problem for the FLUOR PRODUCTS COMPANY.

Dimensional stability of Sandusky Centrifugal Castings enabled the Fluor Products Company to fit more than 7,000 precision parts into each of 5 identical cylinders supplied by Sandusky for use as ammonia synthesis converter cartridges.

Centrifugally cast of a modified CF8 (Type 304L) stainless steel, each cylinder was machined to finish dimensions 27¾" O.D., 26⅜" I.D., 199" long. The bore, surface finished to 35 micro inches, was held to .005" maximum out-of-roundness and .008" maximum taper.

What is more important, to meet Fluor's difficult assembly problems these large cylinders would have to be able to retain these carefully machined dimensions.

"The Fluor Products Company Engineers selected Sandusky Centrifugal Castings because of the stringent specifications, critical delivery requirements and competitive cost of this project. This was the first experience with such centrifugally cast products by the Fluor Products Company; and, the Sandusky Foundry and Machine Company people assisted in making this an extremely satisfactory and profitable project."

While you may have entirely different cylindrical design requirements, Sandusky Centrifugal Castings may well provide a similar cost-cutting answer. We would be pleased to have your inquiries.

Sandusky Quality Centrifugal Castings

Types: Rolls, Sleeves, Rings, Bearings, Bushings, Liners, Bands, Drums, Cylinders, Tubes, Shells, Retorts, Pressure Vessels, Pressure Piping

Sizes: From 7" to 54" O.D.—Lengths up to 33 feet

Materials: Stainless, Carbon and Low-Alloy Steels; full range of Copper-Base and Nickel-Base Alloys

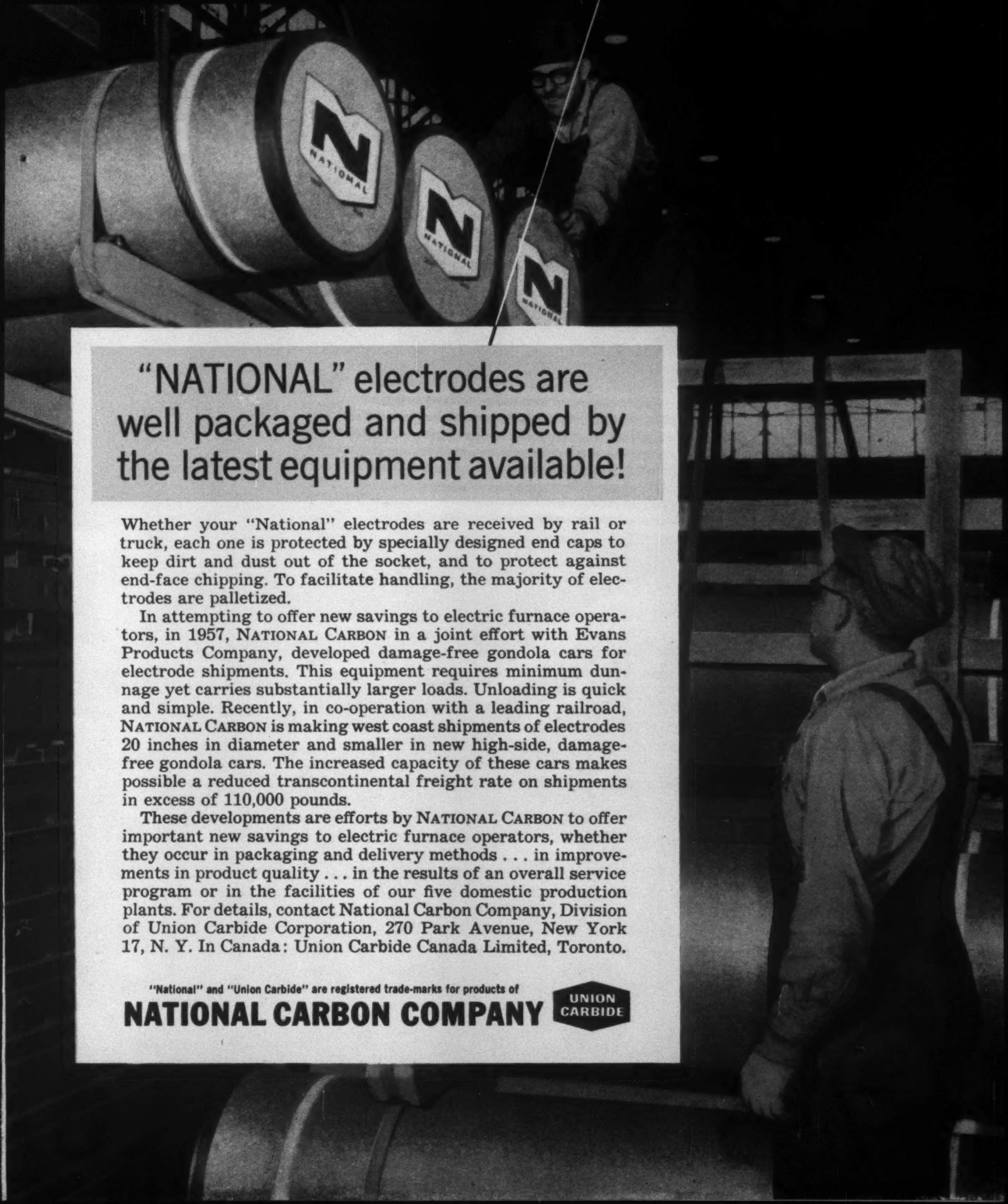
SANDUSKY ® **CENTRIFUGAL CASTINGS**

FOUNDRY & MACHINE CO.

SANDUSKY, OHIO Stainless, Carbon, Low Alloy Steels—Full Range Copper-Base, Nickel-Base Alloys

MAJOR REASONS FOR SPECIFYING NATIONAL ELECTRODES...

QUALITY · SERVICE DELIVERY FACILITIES!



"NATIONAL" electrodes are well packaged and shipped by the latest equipment available!

Whether your "National" electrodes are received by rail or truck, each one is protected by specially designed end caps to keep dirt and dust out of the socket, and to protect against end-face chipping. To facilitate handling, the majority of electrodes are palletized.

In attempting to offer new savings to electric furnace operators, in 1957, National Carbon in a joint effort with Evans Products Company, developed damage-free gondola cars for electrode shipments. This equipment requires minimum dunnage yet carries substantially larger loads. Unloading is quick and simple. Recently, in co-operation with a leading railroad, National Carbon is making west coast shipments of electrodes 20 inches in diameter and smaller in new high-side, damage-free gondola cars. The increased capacity of these cars makes possible a reduced transcontinental freight rate on shipments in excess of 110,000 pounds.

These developments are efforts by National Carbon to offer important new savings to electric furnace operators, whether they occur in packaging and delivery methods . . . in improvements in product quality . . . in the results of an overall service program or in the facilities of our five domestic production plants. For details, contact National Carbon Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. In Canada: Union Carbide Canada Limited, Toronto.

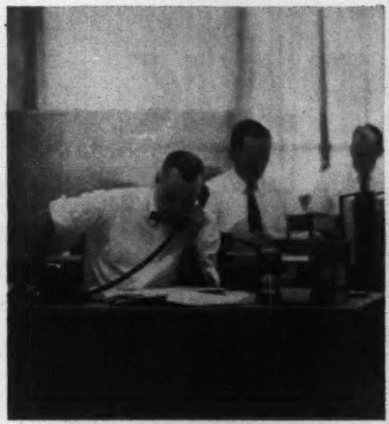
"National" and "Union Carbide" are registered trade-marks for products of

NATIONAL CARBON COMPANY UNION CARBIDE

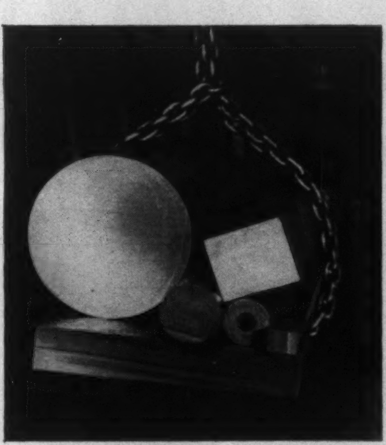
FROM **CRUCIBLE** LOCAL STEEL CENTERS*

YOU DON'T EVEN PAY FOR THE CALL. Free "ENTERPRISE" phone calls to the nearest Crucible steel center are available in most areas. For details, ask the Crucible service engineer who visits you.

"DIAL DELIVERY"



FOR ANY STEEL, ANY SERVICE,* call the inside account salesman who services your company. He's your contact with the entire, integrated Crucible operation.



HIGH STOCK LEVELS OF STEELS, including Crucible's tremendous range of tool steels, enable each steel center to fill customers' largest orders at once.

FLEET OF TRUCKS AT EACH CENTER leaves regularly for customers' plants. Your order arrives at your receiving docks dependably on schedule.

Crucible's integrated operation enables you to order 16,000 specialty steel items — and confirm local delivery — with a single phone call.

Run down the list of special steels you need. You can get all of them — tool steels, high speed, stainless, alloy steels, and even titanium—immediately from the local Crucible steel center. This center is a single, integrated source for every steel and it saves time and money for you.

The steel center's procedures make ordering convenient, too. The inside account salesman can almost always confirm in-stock delivery of your order. But if he can't (which rarely happens), he can quickly locate them at other centers or at the mill. And he can do this *while you're on the phone* — because of Crucible's electronic inventory control and teletype systems.

The Crucible local steel center maintains all the facilities for fast service. It has a battery of saws: huge hacksaws and fast-cutting bandsaws that quickly process your order. And it has a fleet of trucks at its command. So, orders get underway the moment you hang up the phone.

A single phone call brings the services of Crucible's entire operation — integrated from steelmaking to local delivery to you. *Crucible Steel Company of America, Dept. PI06, Pittsburgh 30, Pa.*

CRUCIBLE
ALLOY STOCK LIST

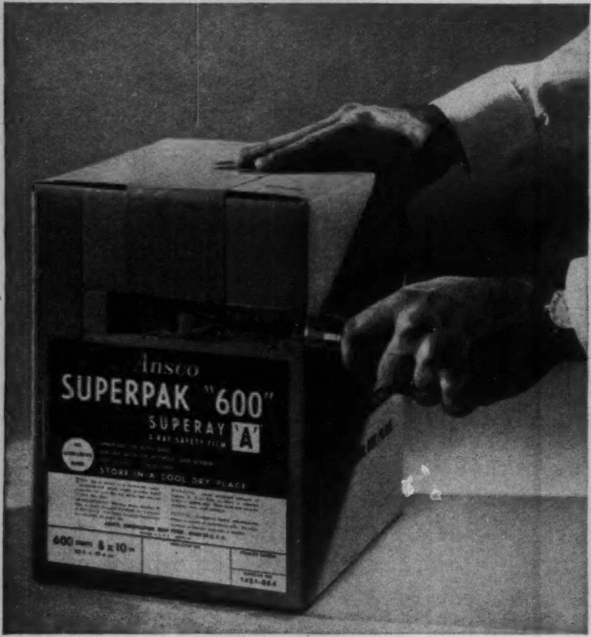
MONTHLY STOCK LIST gives you up-to-date news on local stocks of specialty steels. Ask the Crucible salesman to put your name on the mailing list.

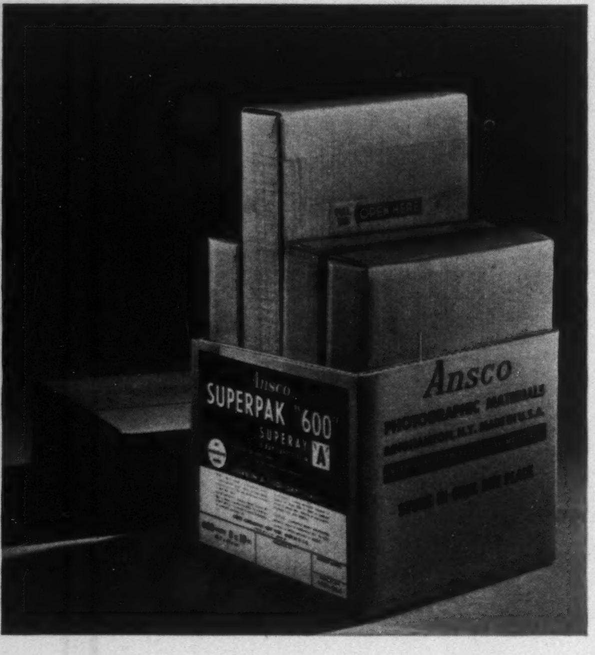
***FROM CRUCIBLE LOCAL STEEL CENTERS:** TOOL STEELS — Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks • HIGH SPEED STEELS — Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits • STAINLESS STEELS — Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles • FREE MACHINING STEELS — Crucible Max-el® rounds, hexagons, plates and brake die steel • ALLOY STEELS — Bars, billets, strip and sheet • COLD ROLLED CARBON SPRING STEELS • DRILL STEELS — Hollow and solid drill steels • ALUMINUM EXTRUSION DIE STEELS • HOLLOW TOOL STEEL • HARD FACING ROD • PLASTIC MOLD STEELS • PERMANENT MAGNETS • and many others.

CRUCIBLE STEEL COMPANY OF AMERICA

BRANCH OFFICES AND STEEL CENTERS: Atlanta • Baltimore • Boston • Buffalo • Caldwell, N. J. • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton • Denver • Detroit • Erie, Pa. • Grand Rapids • Houston • Indianapolis • Los Angeles • Miami • Milwaukee • Minneapolis • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis • E. Syracuse • Tampa • Toledo • Tulsa

NEW! ANSCO SUPERPAK


Ansco
SUPERPAK "600"
SUPERAY 'A'
STORE IN A COOL DRY PLACE
600 8 x 10


Ansco
SUPERPAK "600"
SUPERAY 'A'
Ansco
PHOTOGRAPHIC MATERIALS

for the first time, a new x-ray film packaging that saves time and lowers costs at no sacrifice in quality.

Interrupting operations to open small quantities of X-ray film? Handling many small packages and wrappings? Never again with Ansco SUPERPAK. New Ansco SUPERPAK® is the modern way to increase your efficiency through 600 non-interleaved sheet or 300 interleaved sheet packages of Superay 'A' or Superay 'B'.

Whenever the storage bins (SUPERPAK fits standard film storage bins) need refilling, pause for a moment to open SUPERPAK, work on until the job is completed without further interruptions. Just think of the savings in man-hours and money through this new, sensible method of packaging.

Ansco

Superpak

From every point of view; money, time and general efficiency . . . it makes sense to use SUPERPAK. Ansco, Binghamton, N. Y., A Division of General Aniline and Film Corporation, Manufacturer of World Famous Superay X-ray Films.

ANOTHER NORTON PRODUCT

Why

switch to resin-bonded belts?

You *have at least two good reasons for switching to Behr-Manning resin-bonded abrasive belts:*

1. They give you the benefit of cooler cutting through heat resistance in every step from roughing thru polishing, with minimum loading or shedding.

2. They give you the advantage of lasting much longer than glue-bond belts, easily justifying by production savings, their slightly higher initial cost.

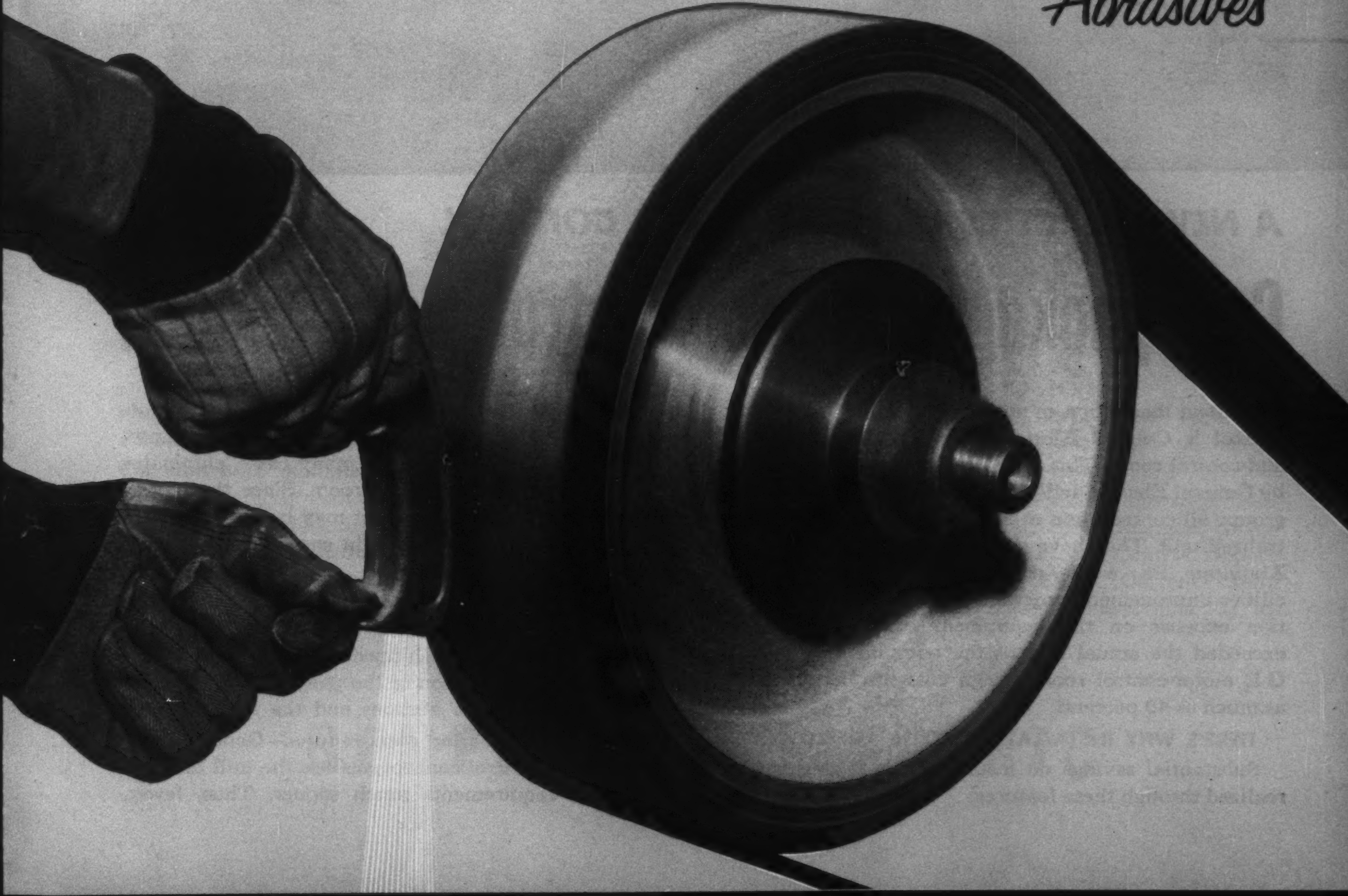
There are two principal types of Behr-Manning resin-bonded abrasive belts:

RESINALL® . . . an all resin-bonded, aggressive belt of strong X-weight cloth, for maximum heat resistance in most all rough and intermediate grinding.

RESINIZED® . . . a resin-over-glue belt of good heat resistance, in strong X-weight for flat polishing, and in flexible J-weight for contour polishing.

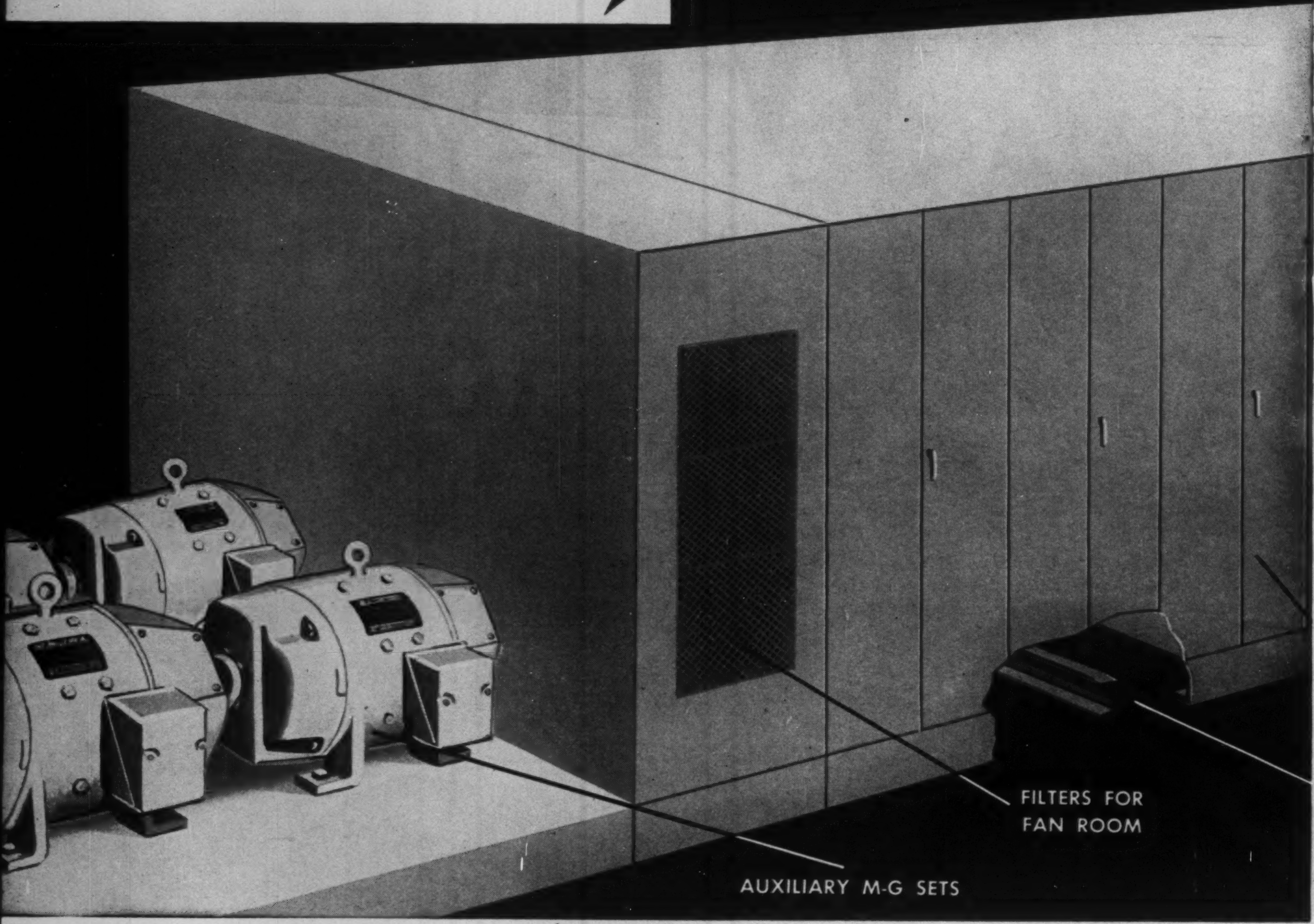
Prove the advantages yourself. Ask for an in-plant test. Write Dept. IA-9, BEHR-MANNING CO., Troy, N. Y., a division of Norton Company.

BEAR
BRAND
Abrasives



FOR QUALITY...
PRODUCTIVITY
... PROFIT

METAL ROLLING
AUTOMATED BY GENERAL ELECTRIC



A NEW PRACTICE IN PROCESS-LINE CONTROL

G-E "packaged" motor-control rooms reduce

The latest innovation in modern steel-mill process-line control is General Electric's new "packaged" motor-and-control room. This novel design, developed jointly by General Electric and Jones and Laughlin Steel Corp., groups all controls and m-g sets into one compact centralized unit. The above unit will be installed at J&L's Aliquippa, Pa., works, as part of their continuing facilities-improvement program. Previously, the installation expense on this equipment often matched or exceeded the actual cost of the equipment. The new G-E motor-control room design cuts installation costs as much as 40 percent!

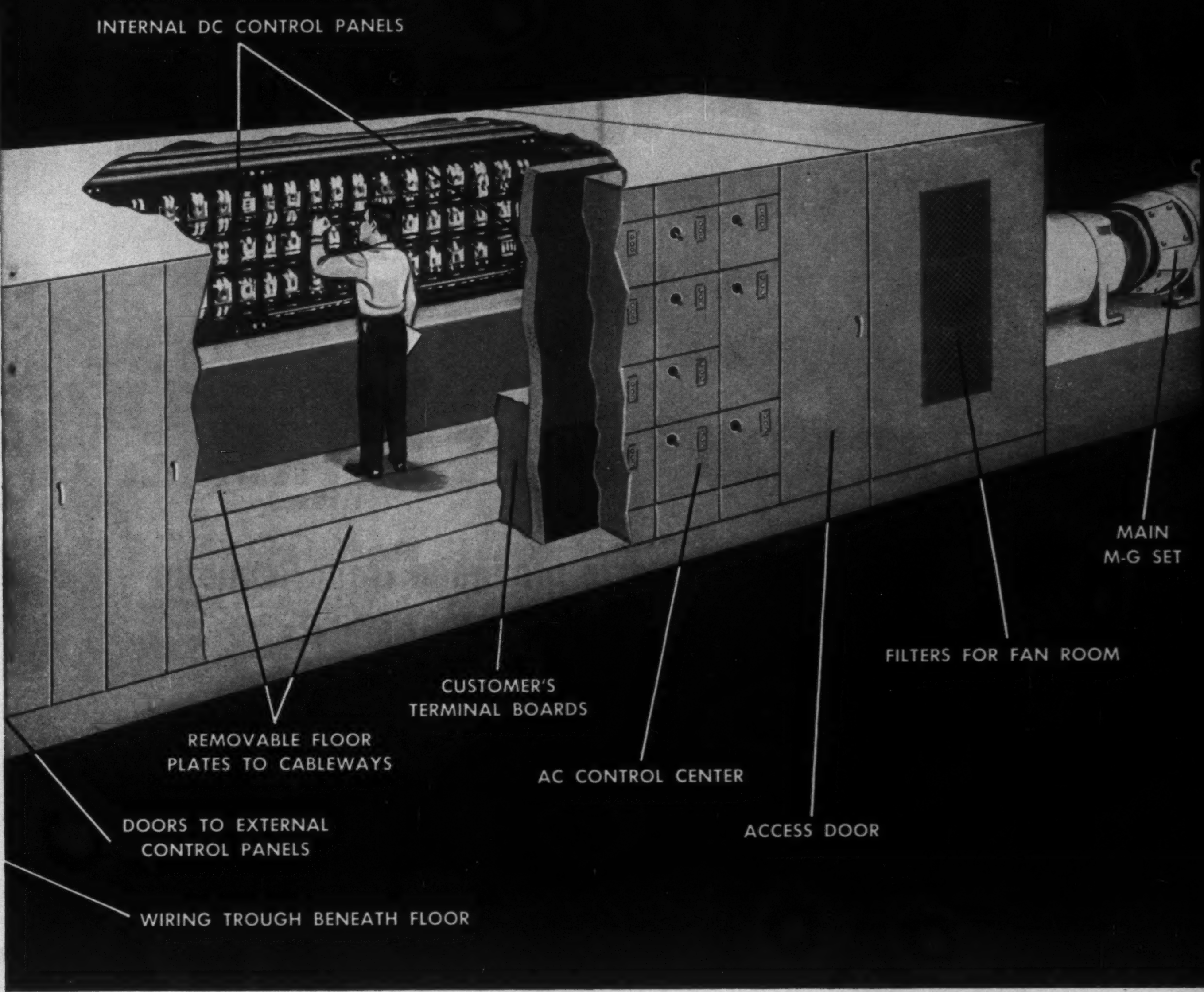
HERE'S WHY INSTALLATION COSTS ARE LOWER

Substantial savings on installation expenses can be realized through these features:

Independent control unit—The General Electric motor-control room is a completely co-ordinated, pre-assembled unit in itself, and in many cases, eliminates the need for a separate motor room. Since the motor-control room is self-contained, it may be located either near the driven equipment or in some previously unused area of the mill.

Field wiring is reduced by one-third or more—All internal connections are made and tested before the motor-control rooms are shipped. The only field wiring required is the connection of the power source and the leads to the operators' stations and the drive motors.

Construction engineering costs reduced—General Electric's grouped control concept enables the mill to know its conduit requirements much sooner. Thus, fewer,



INTERNAL DC CONTROL PANELS
MAIN M-G SET
FILTERS FOR FAN ROOM
CUSTOMER'S TERMINAL BOARDS
REMOVABLE FLOOR PLATES TO CABLEWAYS
AC CONTROL CENTER
DOORS TO EXTERNAL CONTROL PANELS
ACCESS DOOR
WIRING TROUGH BENEATH FLOOR

installation costs as much as 40 percent!

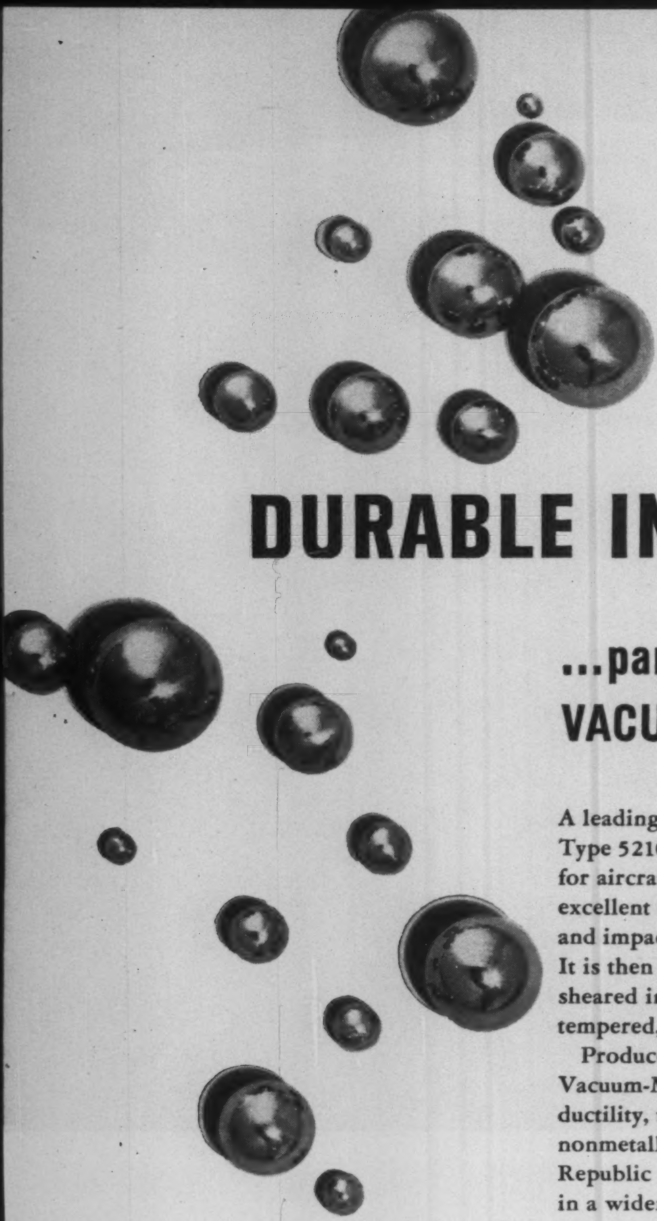
less-complex construction diagrams are needed, and actual construction can begin at an earlier date.

Common base minimizes installation time—This new "packaged" motor-control room, delivered on its own self-supporting platform, can be immediately set on a normal mill floor. It does not require expensive, specially-constructed foundations. With m-g sets built and shipped on a common base, the need to align them at the mill site is eliminated. In addition, regulating equipment is factory-tested prior to shipment, further expediting startup time.

For all the details on this new technique in process-line control, contact your G-E Sales Engineer today! General Electric Company, Industry Control Department, Salem, Virginia, and Direct Current Motor and Generator Department, Erie, Pennsylvania. 785-7

Progress Is Our Most Important Product

GENERAL ELECTRIC



DURABLE IN THE EXTREME

...parts produced from Republic VACUUM-MELTED Metals

A leading manufacturer of ball bearings uses Republic Type 52100 Vacuum-Melted Alloy Steel in bearings produced for aircraft and missile applications. This steel provides excellent resistance to erosion, corrosion, abrasion, and impact. The alloy is supplied to the manufacturer in bars. It is then drawn into wire rods, annealed, drawn to size, sheared into slugs, forged, heat treated, rough ground, tempered, finish ground, and polished.

Produced by the consumable electrode process, Republic Vacuum-Melted Metals offer higher mechanical properties—ductility, tensile strength, and longer fatigue life—with nonmetallic inclusions reduced in number and size. Republic can deliver these metals in quantity on time, and in a wider range of sizes and conditions than ever before possible.

Our metallurgists will quickly help you select, apply, and process vacuum-melted metals: *super alloy steels, constructional alloy steels, high strength alloy steels, bearing steels, stainless steels, titanium,* and *special carbon steels.* For complete information, contact your nearest Republic sales office or return the coupon.

SUPER ALLOY STEELS • CONSTRUCTIONAL ALLOY STEELS • HIGH STRENGTH ALLOY STEELS • BEARING STEELS • STAINLESS STEELS • TITANIUM • SPECIAL CARBON STEELS

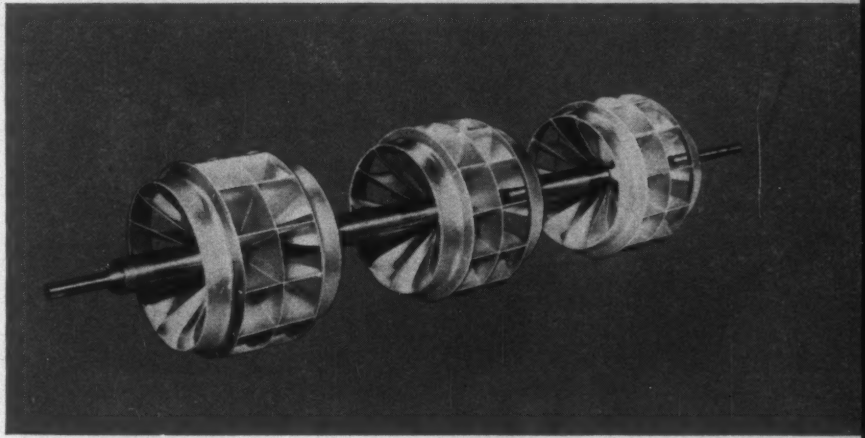
REPUBLIC VACUUM-MELTED METALS are produced in 18- to 32-inch diameter ingots weighing from 4,000 to 20,000 pounds. These can be processed into billets, sheets, bars, strip, and wire to meet your precise requirements. ▶

SEE OUR EXHIBIT

Steel Arena
1960 METAL SHOW
PHILADELPHIA
OCT. 17-21

BUILD IT BETTER WITH AMERICA'S STEEL

MEETING DESIGN REQUIREMENTS: Republic Steel Wire has the necessary strength, ductility, and toughness for difficult forming operations. Republic produces many types for virtually any application: Manufacturer's Coarse Wires; Spring Wires (Standard High Carbon and MB High Carbon); Screw, Rivet, and Heading Wires. Mail coupon for details.



CLOSE-TOLERANCE CONCENTRICITY: Buffalo Forge Company uses Republic ELECTRUNITE® Mechanical Tubing in the production of rotor shafts up to 94″ long. Turning at 1,110 rpm, these shafts require exact balance to maintain high operating efficiency. Close-tolerance concentricity of ELECTRUNITE meets requirements without costly machining. ELECTRUNITE Mechanical Tubing is available in carbon and stainless steel. Mail coupon for details.

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REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. IA-9749-C
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

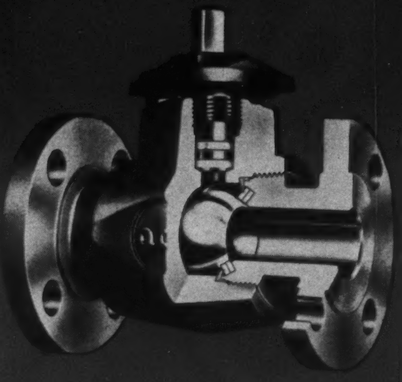
Please send more information on:
☐ Republic Vacuum-Melted Metals
☐ ELECTRUNITE Mechanical Tubing
☐ Wire

Name______________________Title______________
Company______________________________________
Address______________________________________
City______________________Zone_____State______

“No lubricant to contaminate ladings”

PRODUCT OF W-K-M's

Creative Engineering



acf® non-lubricated Ball Valves

ACF Ball Valves are specially designed for ladings that require absolute purity. There is no lubricant, no possibility of contamination. The chrome-plated ball is suspended between Teflon seats under compression for leakproof sealing.

A quick quarter-turn operates this rugged valve. Specify it. You'll get efficient, economical performance. *Available at leading supply stores everywhere.*

Service-proved for 4½ years with such ladings as: high octane gasolines • alkalis • caustics • liquefied petroleum gases • butane • propane • synthetic fuels • penetrating gases • alcohol.

WRITE FOR CATALOG 1000

W-K-M

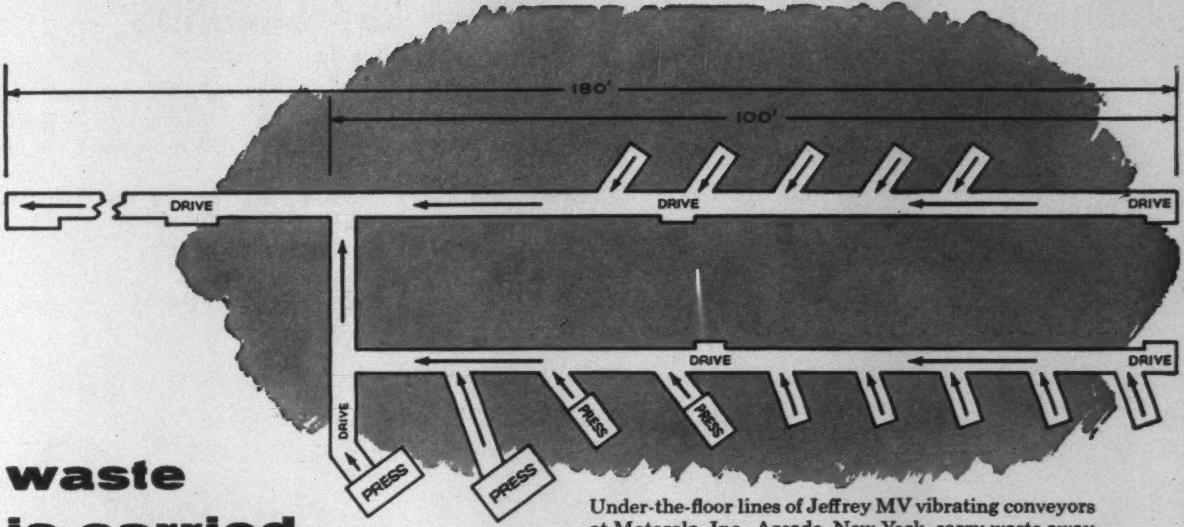
DIVISION OF acf INDUSTRIES
INCORPORATED
P. O. BOX 2117, HOUSTON, TEXAS

ACF non-lubricated Ball Valves feature full bore conduits, Teflon stem gaskets and seats that are sealed from the lading flow.

Working Pressures: In carbon steel with ASA ratings of 150 and 300, and a few sizes in ASA 600; in semi-steel with 200 and 400 pound ratings.

Sizes: ½" through 6".

5911-R



Under-the-floor lines of Jeffrey MV vibrating conveyors at Motorola, Inc., Arcade, New York, carry waste away from the punch presses as fast as it is produced. Engineered by Conveyor Systems, Inc. of Chicago.

waste is carried along smoothly, quietly on the JEFFREY MV CONVEYORS

MOTOROLA's punch press department, with its fourteen busy presses, is kept neat at all times. Metal trimmings and punchings from the presses fall directly through chutes onto Jeffrey vibrating conveyors below the floor. These keep this waste moving toward the end of the building, where a bucket elevator lifts it to an overhead bin, to be hauled away.

Jeffrey MV conveyors move material *fast*, lifting it from the deck with a rapid forward motion; no sliding action to cause wear. They are simple in design, dependable in operation and rugged in construction, so they're economical to operate and low on upkeep.

Bulletins describing Jeffrey mechanical conveyors of all capacities—light, medium and heavy—are available. For copies, write The Jeffrey Manufacturing Company, 925 North Fourth St., Columbus 16, Ohio.

JEFFREY

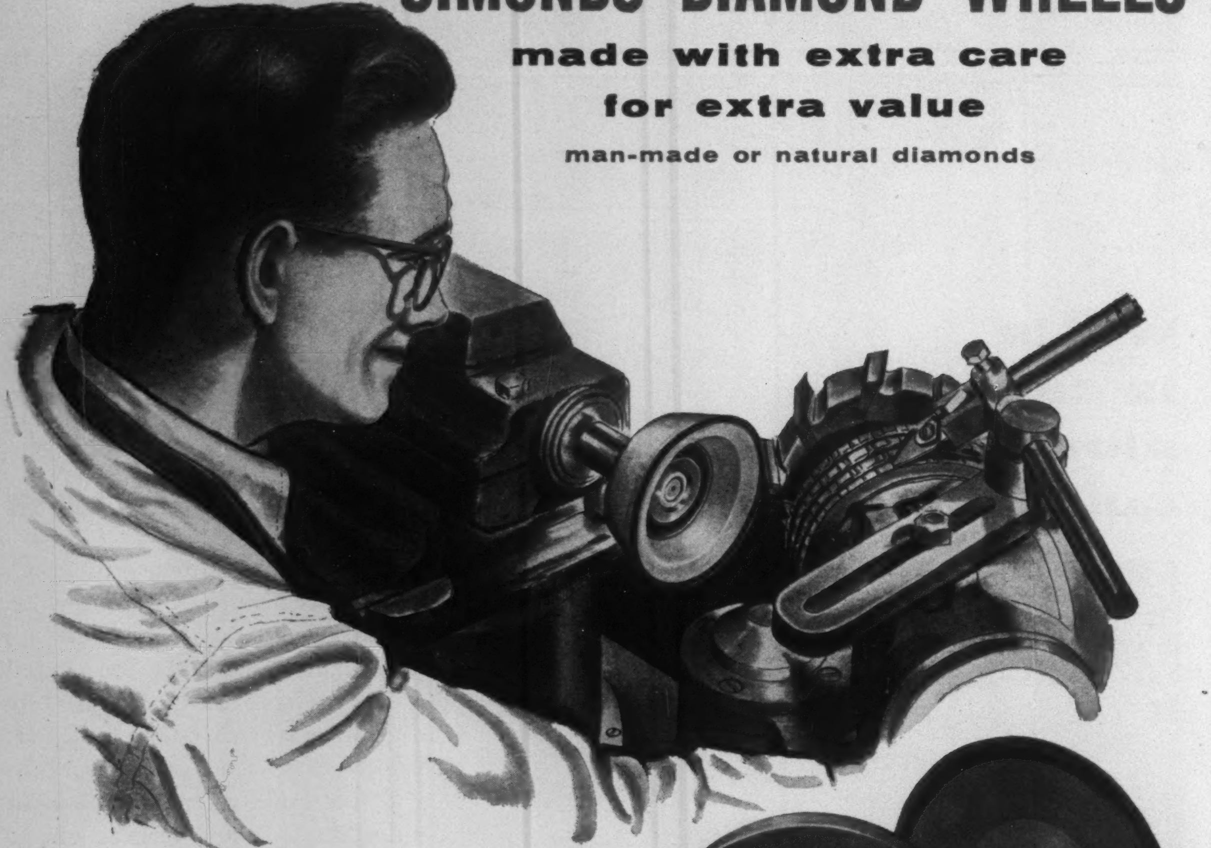
CONVEYING • PROCESSING • MINING
EQUIPMENT. . . TRANSMISSION MACHINERY. . .
CONTRACT MANUFACTURING

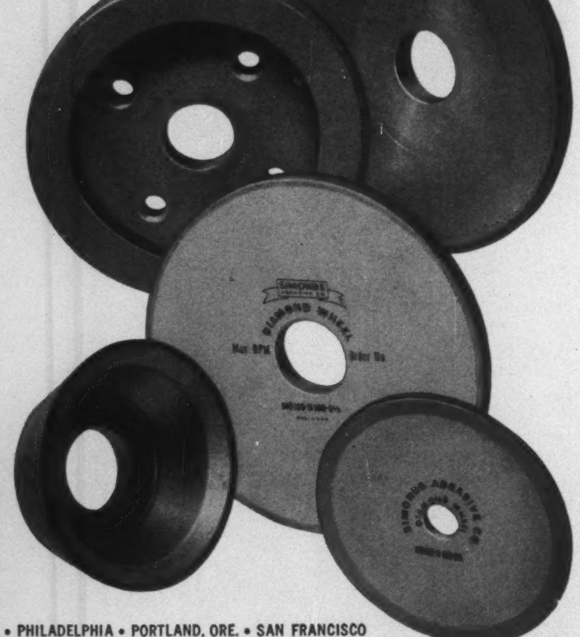
When the job calls for DIAMONDS...say SIMONDS

SIMONDS DIAMOND WHEELS

made with extra care
for extra value

man-made or natural diamonds





You get *extra* use from Simonds wheels because more of the diamonds are *productively* used for actual grinding. That's due to the extra care that goes into their manufacture . . . extra-demanding quality controls, modern techniques and the most accurate equipment . . . extra care that provides better balance and truer running, and consequently, fewer dressings. Special core material in resinoid bonded wheels also needs little or no dressing back as the diamond depth is consumed. Made with true and exact concentrations, and available in all shapes, sizes and bonds. Job-proved grain and grade specifications.

Send for Bulletin ESA 310

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ABRASIVE CO.
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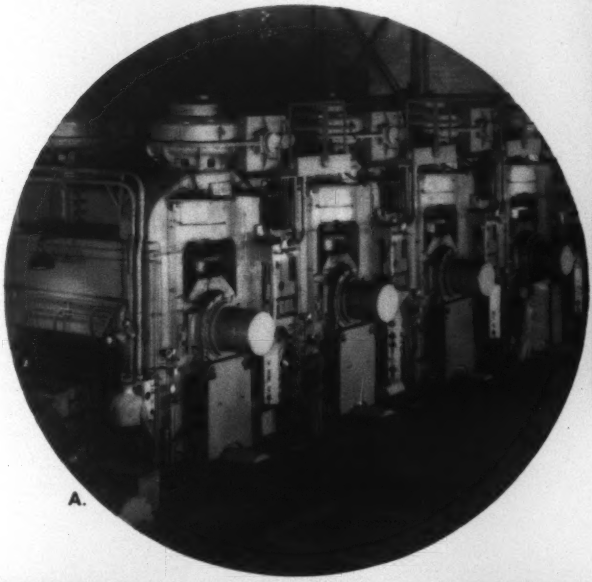
PHILADELPHIA 37, PENNA.
Division of Simonds Saw and Steel Co.

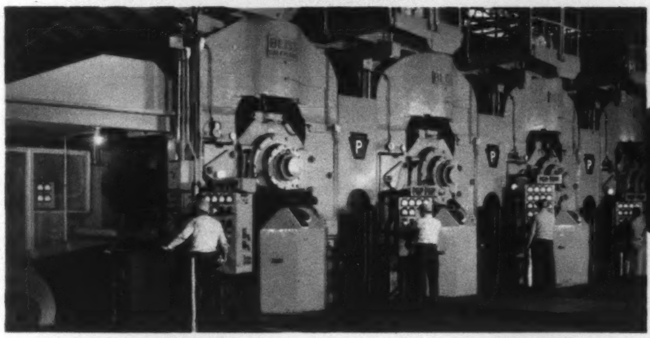
COUNT ON / YOUR SIMONDS DISTRIBUTOR
FAST SERVICE • LOCAL STOCKS

WEST COAST PLANT: EL MONTE, CALIF.—BRANCHES: CHICAGO • DETROIT • LOS ANGELES • PHILADELPHIA • PORTLAND, ORE. • SAN FRANCISCO
SHREVEPORT—IN CANADA: GRINDING WHEELS DIVISION, SIMONDS CANADA SAW CO., LTD., BROCKVILLE, ONTARIO • ABRASIVE PLANT, ARVIDA, QUEBEC

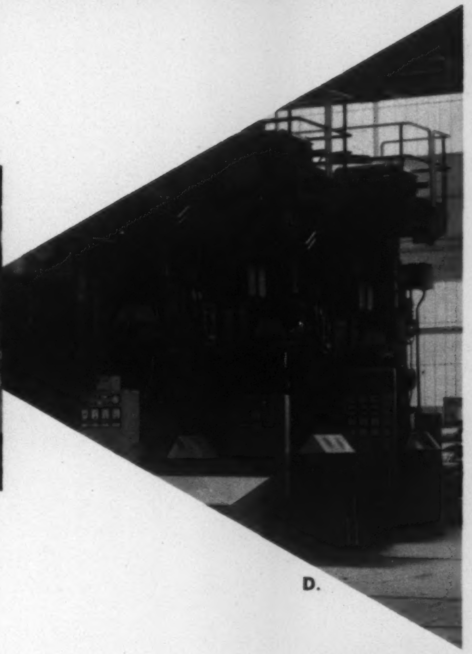


A.

B.



C.



D.

Many of the world's most modern tandem cold-reduction mills carry this trade-mark . . .

A. Fastest, most powerful mill of its kind: Delivery speed of 3800 feet per minute and 24,000 connected horsepower make this the fastest, most powerful cold-reduction mill of its type in the world. It rolls steel strip in widths up to 72″ in coils as heavy as 60,000 pounds.

B. Large tonnage orders or a few coils: Versatility is the design keynote of this Bliss tandem mill. Strip ranges up to 48″ width. Tension reel, coil buggy and horizontal belt wrapper handle coils weighing as much as 34,000 pounds.

C. Speed and precision of control: This big Bliss tandem mill rolls a variety of steels, including stainless and tinplate, delivering strip at speeds up to 3200 fpm in widths to 60″ in coils as heavy as 60,000 pounds. Special electronic controls detect gage variations of .001″, reset rolls in split-seconds.

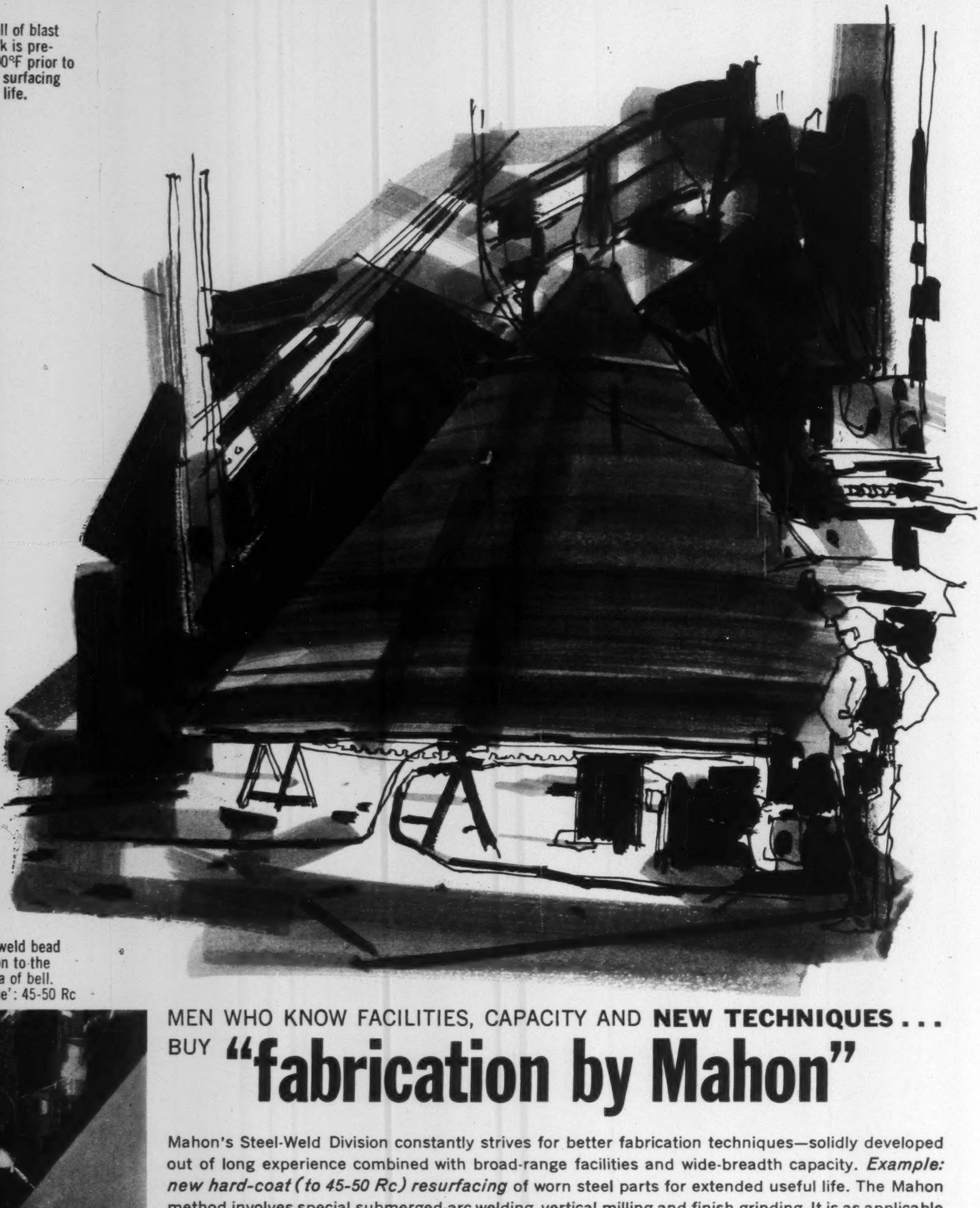
D. First of its kind: This Bliss tandem mill will have a planned fourth stand added later this year. The mill rolls steel strip up to 60″ width; was the first multiple-stand cold-reducation mill in the country in which it is installed.

BLISS
SINCE 1857 ®

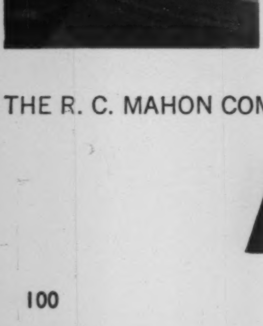
E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

Write for your complimentary copy of our 84-page Rolling Mill Brochure, Bulletin 40-B.



■ Giant bell of blast furnace stack is pre-heated to 400°F prior to Mahon hard surfacing for renewed life.



■ A hard-weld bead is spiraled on to the working area of bell. 'New Surface': 45-50 Rc

MEN WHO KNOW FACILITIES, CAPACITY AND **NEW TECHNIQUES . . .**

BUY **"fabrication by Mahon"**

Mahon's Steel-Weld Division constantly strives for better fabrication techniques—solidly developed out of long experience combined with broad-range facilities and wide-breadth capacity. ***Example: new hard-coat (to 45-50 Rc) resurfacing*** of worn steel parts for extended useful life. The Mahon method involves special submerged-arc welding, vertical milling and finish grinding. It is as applicable to high-wear new parts as it is to reconditioning older pieces. Why not look into how Mahon 'hard-surfacing' can be profitably used in the products you make or the equipment you use? We suggest you write to Mr. J. W. Ault, Manager of Mahon's Steel-Weld Division.

THE R. C. MAHON COMPANY • DETROIT 34, MICHIGAN

Manufacturing Plants—Detroit and Torrance, Calif.
Sales-Engineering Offices: Detroit, Chicago, New York, San Francisco and Torrance

MAHON

Spacious Shelbyville, Ind. plant allows complete assembly of large furnaces (left) and sub-assembly of major components for units too large to ship assembled.

HEAT
from General Electric

How General Electric saves you furnace assembly dollars . . . speeds start-up

From smallest lab furnaces to largest tower furnaces, gas or electric, you can save both time and money by having all or part of the assembly done in General Electric's Shelbyville, Indiana plant. G.E.'s spacious, modern factory has facilities to assemble the largest equipment which can be transported to the installation site.

Your savings are greatest if the entire furnace is assembled in the G-E factory. There's less interference with your operations; you hire less part-time labor; and your furnace is assembled by experienced specialists, directed by design engineers.

Even if your equipment is too large to ship assembled, you can still save by having major sub-assemblies fabricated in the G-E plant, then shipped to your site for final erection. Either way, General Electric provides supervision or complete installation at your plant.

Example: By having major sub-assemblies manufactured in the General Electric plant, an Eastern steel mill was able to start up a 100-foot long, 65-foot high G-E continuous furnace just over four months after construction began.

For fastest, most economical furnace installation, take full advantage of G.E.'s "added value" of factory assembly. Call your nearby General Electric Apparatus Sales Office. 721-33

GENERAL ELECTRIC

Initial Price...
Owning Cost?

Your final steel cost must include both

What goes into *final* cost of steel? Maybe more than you realize. After you know the initial price, figure the further costs of possession. Often hidden and unnecessary, they include the costs of storing, handling and readying your steel for use. Costs your steel service center can often help you reduce or eliminate—to keep your steel costs *low*.

Each steel user's case is different. Ask your steel service center to help you determine the most economical way to buy steel. They will give you a helpful guide for figuring all your costs of possession, such as:

Cost of capital:	**Cost of operation:**	**Other costs:**
Inventory	Space	Obsolescence
Space	Material handling	Insurance
Equipment	Cutting & burning	Taxes
	Scrap & wastage	Accounting

Call your nearby steel service center, or write for free booklet, "What's Your Real Cost of Possession for Steel?"

STEEL SERVICE CENTER INSTITUTE

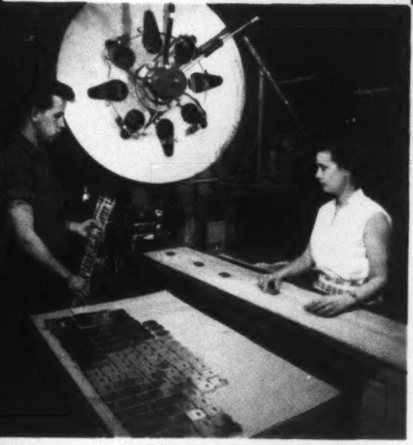
...YOUR STEEL SERVICE CENTER

STEEL SERVICE CENTER INSTITUTE
540-A Terminal Tower, Cleveland 13, Ohio

Steel

ACCORDION DOORS

HOME MAILBOXES



LUGGAGE LOCKS

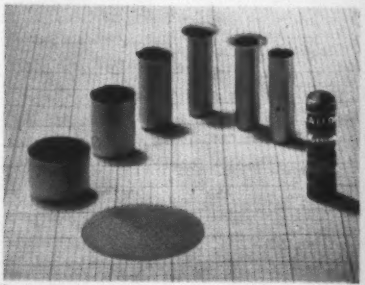
LIPSTICK BASES

CABINET HARDWARE

HOW TO CUT COSTS, BOOST PRODUCT APPEAL WITH

THOMAS STRIP PRE-COATED STEEL

please turn page



BATTERY CANS

BOILER TOPS

Pittsburgh Steel Company

Luggage Locks—Brass Coated strip "strongly helped us compete against low-cost, brass plated imports." That's acclaim John A. Long, vice president-general manager, Long Manufacturing Co. Inc., gives Thomas Strip's brass coated steel. Long, of Petersburg, Va., is the nation's second largest luggage hardware maker. It was hard hit by foreign-made brass locks. "It was a crucial time in one of our big markets," says Sales Manager Edward C. Coleman. "We started looking for new methods and materials. Now, with new designs and using Thomas brass coated strip, we're able to fight foreign competitors." Eliminating plating and hand polishing with brass coated strip, buffed and lacquered on one side, Long trimmed 11 production steps. Result: 50% cost saving on compact-type luggage lock. Thomas Strip maintains product quality, helps Long increase die life; clear lacquer coat acts as lubricant in forming, prevents galling, and preserves product finish in inventory and in handling.

THOMAS STRIP: TRIMS METAL COSTS, SAVES PRODUCTION STEPS, UPGRADES PRODUCTS

Metal fabricators get a head start toward material and production savings with Thomas Strip's coated steel specialties.

Combining the beauty and utility of costlier metals with the strength, economy and formability of steel, Thomas Strip also offers greater product versatility, durability, buyer appeal and design potential.

Here are benefits available to you in Thomas Strip:

- **Shortens Manufacturing Cycle**—Precoated Thomas Strip is ready to fabricate when it's delivered. Initial preparation, cleaning, buffing, final finishing are already done in many cases—you're steps ahead in production.
- **Provides Economy of Steel**—By replacing more expensive metals, but retaining their finish or functional properties, precoated Thomas Strip reduces material costs.
- **Fabricates Easily**—Electrolytically applied, hot-dipped, painted or bonded, Thomas Strip coatings endure fabrication as readily as easy-to-work base steel.
- **Cuts Plating Costs**—Serving as final finish or as base for further plating or painting, Thomas Strip eliminates or at least reduces fabricators' piece-plating expense.
- **More Pieces Per Pound**—Precision rolling and plating to extremely close tolerances give maximum yield in parts per pound.

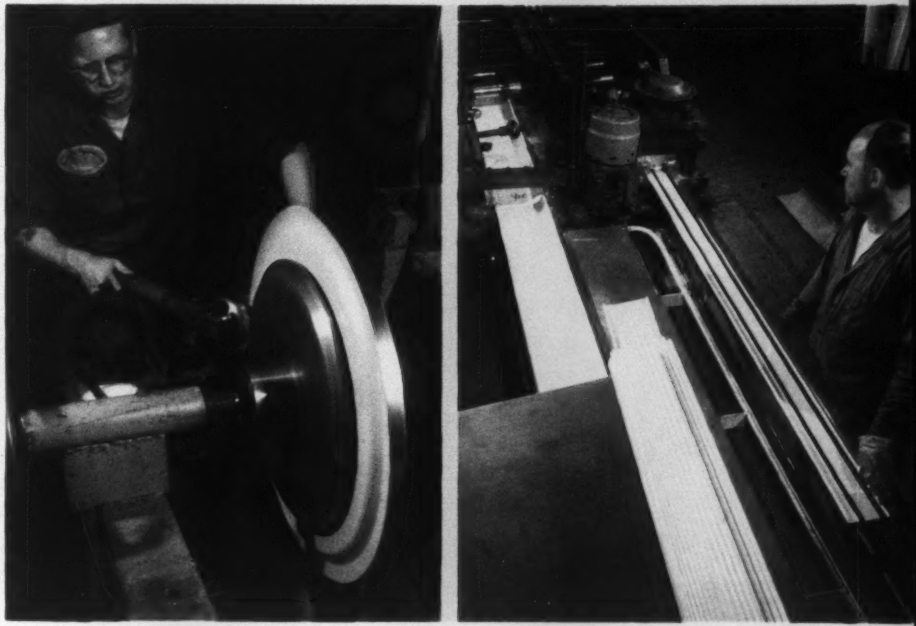
A study of the experiences of Thomas Strip users pictured on these pages should convince you of the benefits available to your product application—or to that product idea in the back of your mind. Read them.

If you need more convincing, detailed literature and samples are yours for the asking.

Better yet, contact one of the Thomas Strip District Sales Offices on the last page and ask for engineering or design help. And tell them you'd like to see our new slide film, "Bright, Modern Metals Provide Proof of the Pudding."

Accordion Doors—Plastic Coated Thomas Strip replaced hand laminating for "lead rail" of STEELITE plastic folding doors made by Clopay Corporation, Cincinnati, Ohio. Strip is roll formed with six 90° bends, ribbed and punched for rivets and door handle. Plastic endures stretching and compression. Also maintains "perfect lamination" to pass 100% inspection, says Purchasing Agent Lewis H. Washburn. Formed rails (left foreground) are assembled on rivet bench.

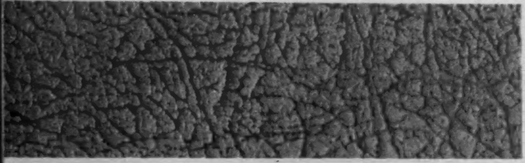
Boiler Tops—Lacquered Strip is spun formed by Edwards Engineering Corp., Pompton Plains, N. J., for boiler tops and top collars in packaged heating systems. Lacquer coat on Thomas Strip's aluminum-killed, drawing quality steel adheres without chipping or peeling. Edwards also uses lacquered strip to roll form back plates and front shields for baseboard units. Purchasing Agent John Bush says: "Thomas is more flexible and cooperative in giving us a quality product. We cut six steps, gained 1,500 sq. ft. of work space and eliminated fire hazards when we switched to prepainted strip. But most important, we can custom cut baseboard units to extra long lengths from prepainted coils." Edwards buys .029″ strip lacquered white on one side in 10.500″ and 5.625″ widths; 23″ width, beige lacquered on two sides.



Battery Cans—Nickel Coated Thomas Strip is used by Cly-Del Manufacturing Co., Waterbury, Conn., to produce mercury battery cases for P. R. Mallory Co. Example: RM-502 inner can, drawn by an Eyelet process from 2¼″ by .010″ strip. AK, non-scalloping steel with .000125″ nickel coat both sides must produce can 1.776″ by .506″ O.D. without draw rings, burrs, earing, peeling or flaking. Thomas has supplied nickel coated strip to Cly-Del nearly 20 years. "Precoated strip does this job better than if we plate after forming," says Purchasing Agent Raymond W. Drufva. "There's not much competition for Thomas in nickel coated strip for close tolerance work. It's the only producer able to supply the material we need for these battery cans."

Lipstick Bases—Copper Coated strip means a ⅔ material cost saving for Truelove & Maclean, Inc., Waterbury, Conn., Eyelet stampings specialists. Normally a brass part, a single style of this drawn shell, is produced at rate of 5 million yearly. Firm buys AK, non-scalloping, close gage (±.0005″) copper coated Thomas Strip for ductility, die lubricating and finish plating properties. Co-owners Tom Truelove and Don Maclean say: "We wouldn't attempt some of these jobs unless the material was copper coated steel. Generally it's no harder to work steel than brass when the steel is Thomas Strip's copper coated. There's not much competition for Thomas in this line." (Top photo shows copper coated lipstick bases being packaged with magnetic lifter.)

PATTERN ROLLED STEEL
OFFERS UNLIMITED DESIGN
OPPORTUNITIES



Home Mailboxes—Pattern Design. The Lady was looking for product appeal. She found it in pattern design sheet from Pittsburgh Steel Co. The Lady is Miss Jeanette L. Troy, director of purchases for The Randall Co. of Cincinnati, Ohio. She explains: "We were trying to find something new for our colonial style home mailboxes—a decorative effect that was different. Pittsburgh Steel's Pattern Design No. 101 gave us the appeal boost we were looking for—and without a proportionate cost boost."

Randall, a division of Textron Inc., produces the boxes for another Textron division, Wagner Manufacturing Co. of Sidney, Ohio. Industrial Engineer Wade Hartman says pattern design sheet saves 50 cents over a mailbox made of similar patterned materials. Rolled-in leather design shows no distortion in forming; permits full thickness of steel to be used in blanking, forming machines. Randall buys pattern sheets in commercial quality .024" thick and in widths 39⅝", 40¼", 42⅞".

Cabinet Hardware—Pattern Design—Thomas Strip's antique patterned steel helps Ajax Hardware Corporation of Los Angeles build strength and beauty into Early American cabinet hardware. President Norman D. Louis says: "Thomas Strip saves many hours by eliminating production steps. The uniformity of appearance, quality and workability of Thomas Strip's patterned steel makes it possible to match Ajax Early American cabinet hardware year after year. Production is fast because of Thomas Strip's close tolerances and formability." Ajax Hardware gives Thomas Strip's uncoated strip an electrolytic coating of rich antique copper or dull black. Photo shows packaging operation.

THOMAS STRIP DIVISION

Pittsburgh Steel Company
Grant Building • Pittsburgh 30, Pennsylvania

Steel

The STEELMARK on a product
tells you it is made of steel.
Look for it when you buy.

DISTRICT SALES OFFICES

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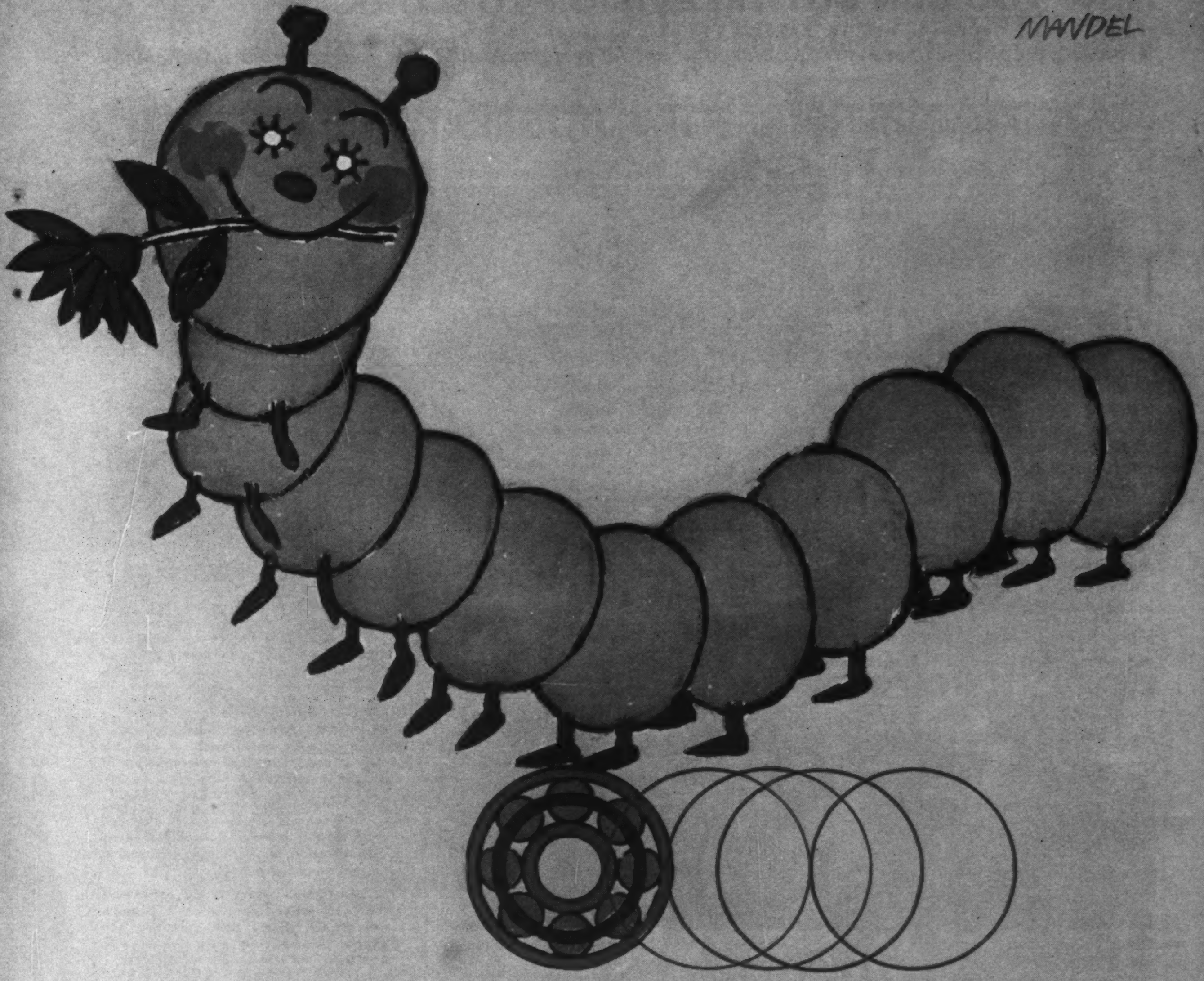


SMOOTH RUNNING

A bearing that turns with the greatest of ease is the bearing that's always certain to please (if you'll pardon our breaking into rhyme). And here at Federal we know that if a finished ball bearing pleases *us,* it's bound to please you. That's why Federal inspectors are such holy terrors when bearing parts reach their quality control points. And if the parts get through, the assembled product is sure to be a ball bearing that will purr sweetly—now and practically ad infinitum. So the next time you want to smooth out a rough anti-friction problem, let Federal Ball Bearings do it for you. You'll find over 12,000 ball bearing sizes and hundreds of types in our catalog. Send for it today.

THE FEDERAL BEARINGS CO., INC., Poughkeepsie, N. Y.

Federal
BALL BEARINGS

One of America's largest ball bearing manufacturers

FEDERAL ON FILM—A 16 mm. color sound film takes you through our 400,000 sq. ft. plant. Loaned free. Just ask for it.

HOW YOU CAN PUT TELEVISION TO WORK

A brief report on how to use KIN TEL closed circuit TV systems to cut costs, reduce errors, up efficiency

Today, hundreds of companies are solving a wide variety of business and industrial problems with KIN TEL closed circuit TV systems.

For example:

U. S. Steel uses a KIN TEL system to see inside open hearth furnaces.

The Los Angeles Department of Water and Power uses one for remote viewing of water-level meters.

Convair, Douglas, Lockheed, and Northrop all watch rocket tests with KIN TEL systems.

Westinghouse watches nuclear power reactor tests with one.

American Potash and Chemical monitors conveyor line and warehousing operations with one.

The San Francisco Naval Shipyard uses one to guard against pilferage.

These, and many other KIN TEL customers — both large and small — have discovered a significant fact: *Closed circuit television is no longer a novelty.* It's a proven, practical piece of equipment that, in many instances, pays for itself within a year. It's a modern, money-making piece of equipment that you can use in your business, in your plant, in your operation.

What Is a Kin Tel Closed Circuit TV System?

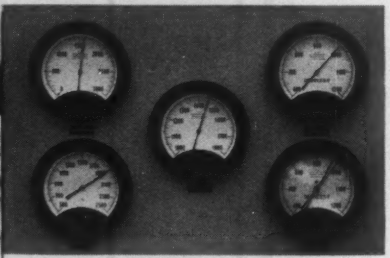
The basic system manufactured by KIN TEL consists of a rugged yet sensitive camera that is small enough to hold in your hand; a receiver that displays pictures that are twice as sharp as you can get on your home TV set; and a camera control unit that is so automatic the only control you have to touch is the on-off switch.

More Than Likely, Your Business Can Use Such a System.

You can use one to watch events or operations that are tedious, difficult, dangerous, or even impossible for men to watch.

Dependable KIN TEL TV systems see where men cannot survive; withstand tremendous extremes in temperature and pressure; perform both critical and routine jobs inexpensively, faultlessly, safely, tirelessly.

You can use one for data transmission.

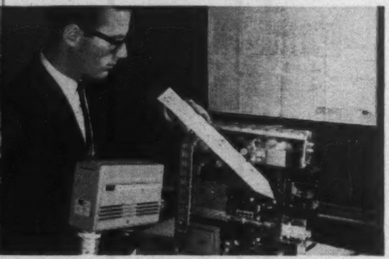


All types of visual information–from blueprints to fingerprints to graphs–are transmitted over great distances quickly, accurately. Such systems save money, reduce errors and confusion, speed operations.

You can use one for surveillance work.

KIN TEL cameras scan vast areas; guard valuable equipment and property; never blink, quit, sleep, or make an error; watch many operations at once; transmit all information to a central monitoring point.

You can use one for on-the-job training.



Students study operations viewed by a KIN TEL camera. Such systems permit mass teaching that gives each student an unobstructed view; provide on-the-spot realism; end expensive, disturbing plant tours.

Here's What a Kin Tel System Can Do for Your Business

It can do what it is doing, right now, for hundreds of other firms. It can increase the over-all efficiency of your entire operation. It can help you tighten production and inventory controls, help you better your services to customers and clients. It can reduce errors and confusion and duplication. It can cut costs. It can save you time and money. It can free valuable men from tedious and routine tasks. It can give you the modern tools you need to keep pace in this highly competitive market.

For a more specific analysis of how KIN TEL TV can go to work for you, write direct for catalog 6-103 and the name of your nearest KIN TEL engineering representative.

8 Reasons Why So Many Firms Insist on Kin Tel TV Systems

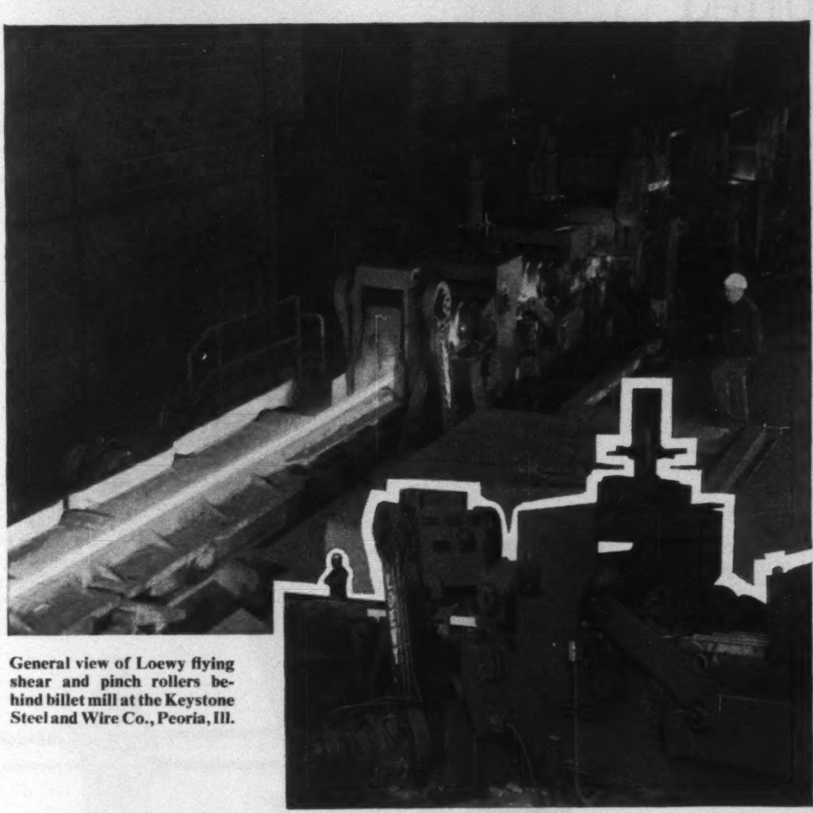
1. **Reliability.** KIN TEL equipment is designed to keep working, day in and day out. It's the first choice for ICBM and other missile programs that depend on TV, that can't afford to compromise with reliability.
2. **Picture Quality.** Full 650-line resolution provides maximum delineation, essential for qualitative observation of complex operations, and for transmission of printed material.
3. **Automatic Operation.** KIN TEL TV is the only closed circuit system that provides entirely automatic, through-the-lens compensation for light-level changes of several thousand to one.
4. **Sensitivity.** With KIN TEL equipment, the light needed to read this page is enough for sharp, clear pictures; and usable pictures can be provided with less than one foot-candle illumination.
5. **Ease of Installation.** No site preparation is needed, no interacting electrical adjustments are required. All units fit in standard 19-inch racks.
6. **Simplicity of Operation.** With no changes in lens iris to make, the only thing the operator has to know is the location of the on-off switch.
7. **Adaptability.** A complete line of shelf-item system components and a variety of cameras and monitors permit observations of nearly every kind of operation, under all kinds of conditions.
8. **Application Help.** You don't have to waste your money and time on application engineering. At no obligation, KIN TEL's nationwide factory-trained field engineers will determine whether or not a TV system can be put to profitable use in your intended application.

5725 Kearny Villa Road, P.O. Box 623, San Diego 12, California, BRowning 7-6700

KIN TEL—pioneer and leader in closed circuit television

KIN TEL
A DIVISION OF
COHU
ELECTRONICS, INC.

KINEMATICS--the reason why Loewy flying shears perform with unerring accuracy



General view of Loewy flying shear and pinch rollers behind billet mill at the Keystone Steel and Wire Co., Peoria, Ill.

Close-up of flying shear as viewed from pinch roller side

Billet approaching flying shear

Shear cycle starts

Cutting operation

Cut finished

Installed behind a continuous billet mill, the electrically operated Loewy oscillating flying shear is indeed an extraordinary precision tool. Its speed is synchronized with the speed of the mill. Its adjustability conforms exactly with the material coming from the mill. Sequence of cuts and cut length of material can be changed at will.

The kinematics of the knife blades—a patented feature of Loewy flying shears—is the dominant factor in achieving clean cuts without any distortion of the billet. For each individual cut an automatic oscillating lever mechanism actuates the shear and then returns the blades to their initial position at the end of the cycle.

The flying shear is a part of the complete Loewy billet handling system: skew-roll grouping tables behind the shear, billet cooling beds, and runout tables from where the material is selectively kicked off into collecting pockets. The shear itself can, of course, be furnished for an already existing system.

All B-L-H machinery is designed and built to our customers' requirements. B-L-H's Industrial Equipment Division builds Loewy rolling mills and auxiliary equipment, as well as Loewy hydraulic machinery. To avail yourself of our services, write Dept. A-9.

Visit us at Booth No. 504, AISE Show September 27-30, Cleveland Public Auditorium Cleveland, Ohio	Visit us at Booth No. 1226, NMTBA Show September 6-16, Amphitheatre Chicago, Ill.

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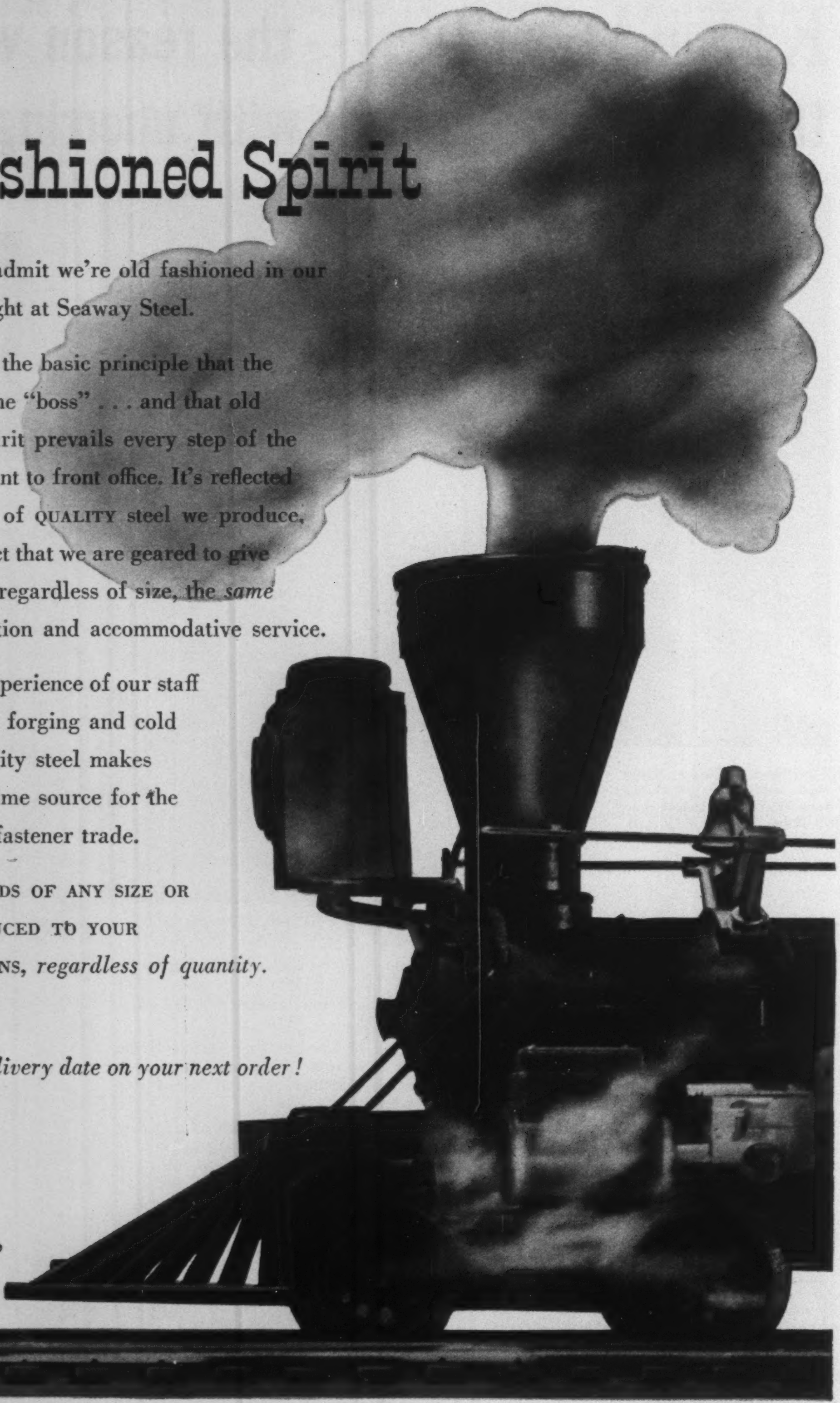
Old Fashioned Spirit



We happily admit we're old fashioned in our train of thought at Seaway Steel.

We cleave to the basic principle that the customer is the "boss" . . . and that old fashioned spirit prevails every step of the way from plant to front office. It's reflected in every ton of QUALITY steel we produce, and in the fact that we are geared to give *every* order, regardless of size, the *same* special attention and accommodative service.

The broad experience of our staff in producing forging and cold heading quality steel makes Seaway a prime source for the forging and fastener trade.

BARS AND RODS OF ANY SIZE OR SHAPE PRODUCED TO YOUR SPECIFICATIONS, *regardless of quantity.*

Ask us about a delivery date on your next order!

☎ LUDLOW 9700

SEAWAY STEEL CORPORATION

101 EAST AVENUE • NORTH TONAWANDA, NEW YORK

FURTHER INVENTORY LIQUIDATIONS and slight increases in new orders are noted in the September business survey of the National Association of Purchasing Agents. The association's Dr. J. H. Hoagland cautions: "Since inventory changes are a major factor in fluctuations of total business activities, the danger of a business recession is still present."

THE LOW POINT OF THE MACHINE TOOL INDUSTRY has been reached, according to Value Line Investment Survey. The survey looks for new orders to rise from an estimated $375 million in the nine months preceding the Machine Tool Exposition to $525 million in the subsequent nine months.

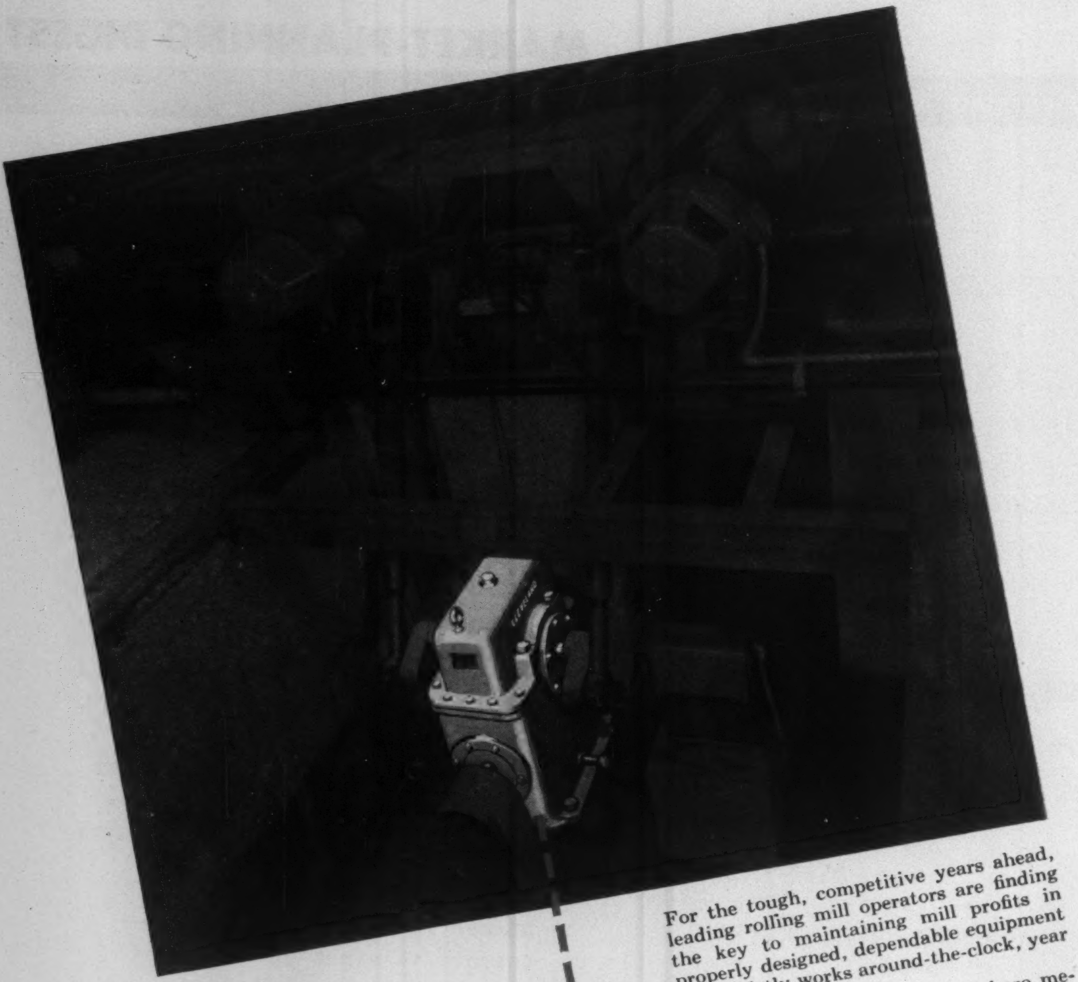
NEW ALUMINUM ENGINES will be introduced by at least two, probably three, automakers on 1961 cars. Chrysler Corp. will bring out a 6-cylinder engine that will be available on the Lancer, Dart, and Plymouth. It will have a diecast aluminum block with cast iron head. About 4000 engines have been built, but they will not be available for early model runs. One of the new compacts is expected to announce its aluminum engine later.

ANOTHER ALUMINUM AUTO APPLICATION, the bumper, will not make its appearance this year. This is contrary to plans of one automaker which actually had ordered 10,000 bumpers from one aluminum company. Reportedly, the trouble occurred in costs, which were running higher than first estimated and the deal was called off.

A HANDY TOOL FOR MARKETERS can be the Labor Dept.'s list of major labor agreement expirations and reopenings. Advance noting of negotiation dates in customer industries can aid in planning.

A SIGN IN THE NEW TREND OF STEELMAKING equipment has been voiced by Allegheny Ludlum Steel Corp. president, E. J. Hanley. He forecasts the last openhearth shop has been built for the industry. "Electric furnace capacity will grow steadily," says Mr. Hanley, "and basic oxygen is due for spectacular growth."

INDUSTRIAL FASTENERS HOLD STEADY. The Industrial Fasteners Institute index of shipments for July was 91, adjusted (1956-58=100). A 3 point decline from June is not considered significant as industry vacation shutdowns require heavy adjustments.



Rugged Cleveland Speed Reducer gives Birdsboro cooling bed fast, dependable shuttle bar lift

For the tough, competitive years ahead, leading rolling mill operators are finding the key to maintaining mill profits in properly designed, dependable equipment that quietly works around-the-clock, year in—year out.

Such a mill unit is this Birdsboro mechanical cooling bed installed in a prominent mid-western steel producer's plant. It utilizes a 500-AH heavy-duty Cleveland Worm Gear Reducer to drive the bed's shuttle bar lift mechanism.

In steel rolling mills all over the world, rugged Clevelands are hard at work, as efficient as the day they were installed—some as long as 37 years ago. Specify Clevelands whenever a quiet, dependable, maintenance-free method of power transmission is vital. Write for free Bulletin No. 145—it gives the complete "Cleveland Story". Or better yet, contact your nearest Cleveland Representative today.

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A Steel Man Looks Ahead— "You Can't Afford Not to Move"

The IRON AGE Interviews —E. J. Hanley, President, Allegheny Ludlum Steel Corp.

With ample steelmaking capacity, mills will put more emphasis on service, says E. J. Hanley, presidennt of Allegheny Ludlum Steel Corp.

In this exclusive interview with G. J. McManus, IRON AGE Pittsburgh editor, he takes a look at what's ahead for the industry.

Q. Mr. Hanley, how does your business look for the immediate future?

A. I think things will get better. There is no doubt that customers are currently using steel faster than they are buying it.

What concerns me most is whether the cut-up rate is matched by the sales rate for products made of steel. If it isn't—if inventories of finished products are building up—this could back up on us.

Q. What is the steel outlook for the next two or three years?

A. For the past 15 years, we've had a situation where mills operated close to 100 pct of capacity most of the time. Now, I think we are in a period where you can regard 80 to 85 pct as normal. I don't think this means we have too much capacity.

Q. From a standpoint of service, what adjustments are required by the reduction in normal demand?

A. We'll have to carry more inventory than we carried in the past. I hope there won't be big swings in the future. You can't give good service at 100 pct of operating capacity.

When such a situation exists, you must expand capacity until you can provide serice. I think we're now approaching a period of normal, healthy service.

Q. For a man who is trying to evaluate steel operations, what changes will current conditions bring?

A. Because of the inventory cushion, short-term changes in the melting rate can be misleading. At current levels, the shipping rate can vary widely from the melting rate for short stretches.

When we closed down our melt shop this spring, we had calls from many security analysts throughout the country. Actually, there had been no big change in our picture; we were just bringing down inventories.

The rapid expansion of recent years should also be considered in looking at operating rates. A comparison with tonnages produced in past years gives a better idea of steel production than a look at the operating rate only.

Today, capacity is much greater than it was a few years ago. Accordingly, an operating rate of 55

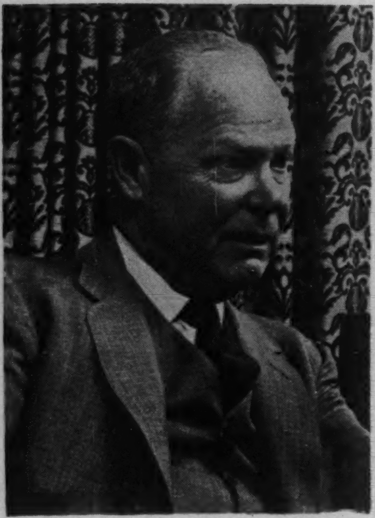
Also in This Issue

Included in this AISE issue of The IRON AGE are the following special articles:

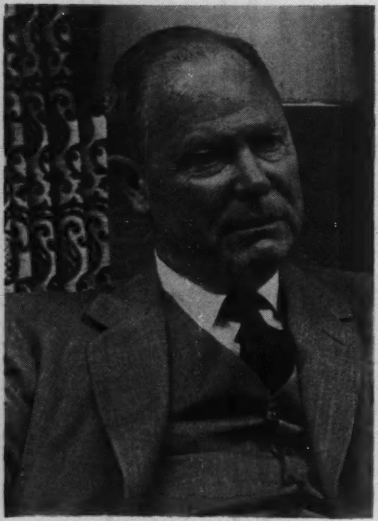
New Steelmaking Processes p. 153
World Ore Trends p. 159
World Steel Trade p. 162
Computers in Steelmaking p. 166

Edward J. Hanley has been president of Allegheny Ludlum Steel Corp. since 1951. During that time the company has spent about $125 million for capital improvements, expanding and improving equipment.

Before becoming president, Mr. Hanley served successively as company secretary, treasurer, vice-president in charge of finances, and as executive vice president. He serves on several boards of directors.



"For the past 15 years . . . mills operated close to 100 pct of capacity. . . . Now you can regard 80 to 85 pct as normal."



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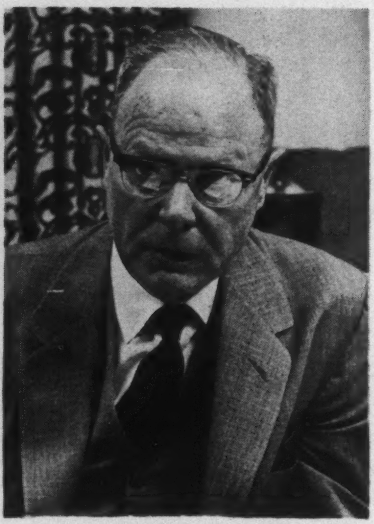


"We're not operating on a cost-plus basis. The customer sets the price . . . deciding what he'll pay for a product."

pct actually produces much more steel than was made a few years ago at that operating level.

Q. With ample capacity for current demands, do you see less spending for expansion in steel?

A. I don't think we will need as much money for expansion as when we were in a situation of scarcity. With oxygen, you can increase capacity of present equipment or add more capacity with a small investment.

This is not a new condition. Over the past 10 years, Allegheny Ludlum hasn't added any new melting facilities. However, our melting capacity has been substantially increased.

Q. Does this mean all types of capital spending will be curtailed?

A. No. If you have a project that can reduce costs and give a fast payoff, you can't afford not to move ahead.

Q. Will earnings provide enough money for major capital programs?

A. I don't think you expand out of retained earnings alone. It isn't true, as some people maintain, that the steel industry has made customers pay for its new plants. We've used loans and equity financing, as well as earnings, in recent years. But, you need profits to justify spending. For a project that offers a short payoff, there is no problem in getting money.

Q. Are steel prices too low?

A. I don't think current prices are as high as they might be if you take into account proper depreciation charges and the full cost of using facilities that were bought for half the price of present replacements.

Looking at it from the standpoint of real costs, steel prices should be higher.

Q. Does this mean price increases are coming?

A. We aren't operating on a cost-plus basis. The fellow who sets prices is the customer. He decides what price he will pay for a product.

Right now, there are strong forces working against price increases. You have the threat of imports. Low operating rates mean tough competition.

I don't want to say we will never see prices go up. Prices will move up if an inflationary cost situation crops up. In the long run selling prices must cover all costs.

Q. Is the steel industry in a period of revolutionary technical change?

A. New melting practices are revolutionary. I think bright annealing may be generally adapted for flat-rolled stainless. But change is still incremental to a large extent. I don't see anything that is going to completely change the character of steelmaking.

Q. Can the steel industry meet the needs of the missile program for special metals?

A. This problem is complicated by the small amounts of metal involved. For this reason, there is less opportunity to recover research and development costs.

When jet engines were being made in large numbers we could afford to make heavy development expenditures because there was substantial volume.

Tool Show Points to New Trends

Miniature Tools, Tape Controls Gain Emphasis

More than 130,000 visitors to the National Machine Tool Exposition in Chicago are noting new machine tool trends.

More manufacturers are producing tape controls and miniature space age tools. Also, buyers and distributors want them.

—By T. M. Rohan.

▪ Two definite trends are noted by the more than 130,000 visitors to the National Machine Tool Exposition in Chicago. One trend is toward greater use of tape controls; the other is to miniature tools.

Exhibits are housed on three sites. At the International Amphitheatre there are 1000 different metal cutting and forming tools on display from 125 manufacturers. Other control exhibits, accessories and allied lines are housed in nearby Navy Pier at the Production Engineering Show.

Foreign machine tool producers and some U. S. accessory and allied equipment makers are off in a third area for the Coliseum Machinery Show.

The Big Trend—The biggest, and expected, trend at the show is the swing to tape controls. Tape control — both magnetic and punched —is now done on all three axes, including point-to-point and contour.

The less expected trend is in midget, high-precision tools for space age missile, electronic, and instrument work. Probably a dozen major companies have jumped into miniature tool production for the first time.

During the early days of the exhibits, visitors were casually shopping. Lately, however, they are discussing price details and delivery dates. Exhibitors hope, of course, that the show will produce enough new business to reverse the latest drop in new orders.

Most Noticeable—The trend to midget precision tools is most noticeable in small lathes. Among the companies displaying them, most for the first time, are: Warner and Swasey Co., Nebel Machine Tool Corp., Monarch Machine Tool Co., Sidney Machine Tool Co., Hardinge Brothers, Inc., and Barber-Colman Co.

Nebel's Bradford Von Wiese notes that West Coast missile producers are a ripe market for midget precision tools. He said, "At the distributors preview, four California distributors asked to handle this line. All felt that it will be a hot item for the West Coast aircraft and missile plants."

The new Nebel high speed precision lathe has infinite speed variation within a 9 to 1 range using a Cleveland speed variator. This transfers shaft power by friction across a swivel-mounted rotating steel ball. The ratio is varied by moving the axis of the ball so the friction wheel runs near the poles or equator. It is based on a Swiss invention.

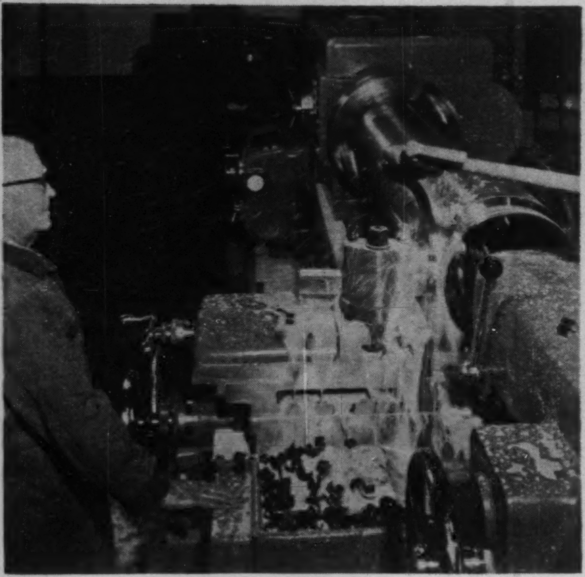
Big Attention Getters — At the Warner and Swasey display, William Orebaugh said the O-AC and No. 3 AC miniature chucking machines and universal turret lathes were the biggest attention getters.

Mr. Orebaugh said, "Many people are seriously interested in them. I think quite a few will be sold for fine precision work where instrument type lathes are now used, but just don't have the beef."

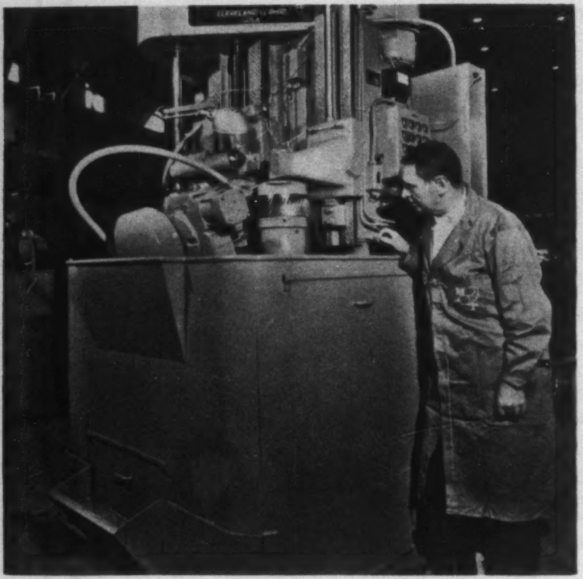
The company's new point-to-point and contour controlled turret lathes and chucking machines are also big drawers.

Largest exhibitor and producer in the field is Cincinnati Milling

IN ACTION: Visitors to the National Machine Tool Exposition in Chicago watch Kearney & Trecker Co.'s Milwaukee-Matic in action. The unit mills, drills, bores, counterbores, taps, reams, selects and changes tools.



A HUSKY HOGGER: This large 40 in. by 20 in. engine lathe is a product of American Tool Works Co. It can "hog" metal from a steel billet to ¾ in.



HOBBING GEARS: The Lees-Bradner Co. has produced this new vertical, heavy-duty hobbing machine. It turns out highly accurate gears.

Machine Co. It has 10 new machines and a total of 62 on display and operating. Two major attractions are a 12-in. high-speed hydroform machine for high production deep drawing and a five-fold increase in capacity.

Just Keeps Squeezing—An intraform chipless machine for forming internal diameters will turn out 260 parts per hour on an internal helical spline. The internal contour is formed by a continuous squeezing action between revolving dies and the forming mandrel.

A new small milling machine line with 12 in. wide table and automatic cycling is aimed at cutting production costs on small and medium parts.

Meanwhile, Micromatic Hone Corp. has one of the biggest precision demonstrations, finishing 600 bearing race components per hour to an accuracy of 25 millionths of an inch.

The smallest gear in the show is being made by Hamilton Tool Works. The gear measures .055 in. across, about the size of a pinhead. It has eight teeth and a center hole with an .018 in. diameter. The gear is used in ladies ring-watches.

High Hopes—Carleton Machine Tool Co. has high hopes for its numerically controlled boring and drilling machines. According to Carleton president, William Dermody, "Two machines have been installed so far in a printing machinery company and another machine tool company. Also, there has been lots of interest shown at the show. The machines go for $80,000 each and are set up for full tape control."

Another new idea to planers has been added by G. A. Gray Co. with its Flying Scot. It has two-way cutting heads and, with an ideal setup, could make nine cuts using three heads with three tools each.

The biggest attraction at the Cincinnati Shaper booth is a new press brake with automatic slowdown. An official says it has been moving well for steel furniture makers. The machine increases production nearly 60 pct and can be run by a non-skilled operator.

Shearing and Bevelling — A foreign shear at the Coliseum is square-shearing and bevelling plate up to 1¼ in. in one stroke. It is distributed in the United States by a McKay Machine Co. subsidiary. It does not require changing position of the blade or re-setting of the machine. Therefore, production time is nearly cut in half.

Gisholt Machine Tool Co.'s new Factrol magnetic tape controlled turret lathe has already been ordered by several companies. It has a radical departure in control since it uses a 2½ in. wide magnetic tape rather than standard 1 in. wide 8 channel punched tape.

This gives it simultaneous two-axis motion on both the turret and cross slide so it can contour and taper together.

For Ceramic Tooling—The top crowd pleaser of Lodge & Shipley Co. is a 25 in. heavy duty engine lathe designed for ceramic tooling. It will take a ⅞ in. cut with carbide tools on 4140 steel with .0027 in. feed at 192 rpm.

Another of the major attractions is Kearney & Trecker Co.'s already famous Milwaukee-Matic. This turret machine does drilling, milling and similar jobs with a wide selection of tools under tape control. It has cut tooling costs from as much as $2350 to $835 and the set-up time from five hours to none, after one tape preparation.

Business Needs Political Action

But More Effort Is Needed to Tell Industry's Side

Experts disagree on methods, but all agree business isn't doing a thorough job politically.

A program is needed to keep business from losing influence.—By F. J. Starin.

▪ "The former administrative assistant to an influential U. S. Senator told me that a spokesman for organized labor used to make it a point to drop in on him at least weekly.

"Most of the time, he said, the two men just had coffee or passed the time of day. But when controversial legislation came up they were old acquaintances, if not old friends, and labor's position and view were always clearly defined and clearly understood.

"The only time this important Senatorial assistant ever saw someone from industry was on what he called a 'fire fighting mission' and then always in great haste with great demands."

This story was told by Joseph Eley, public affairs counselor to an American Management Assn. seminar on "The Corporate Role and Policy in Political Activity" in New York late last week.

Under Serious Attack — Mr. Eley's point: "The American Business system is under serious attack. No one is going to tell industry's side of the story but industry management. And they are not doing it."

Mr. Eley offered the executives several suggestions to turn this tide. Industry must pay some attention to legislators, insists Mr. Eley.

"Every multi-unit corporation ought to have a full time spokesman in Washington. And smaller companies with similar problems ought to team up to hire representation. More attention should be paid to state legislators as well."

Donald W. Gapp, Donald Gapp Associates, industrial community relations specialists from Meadville, Pa., agrees that industry is not telling its story. But he feels that talking to legislators would do little immediate good.

How Many Votes?—"When you bring your case before a legislator," he explains, "one of the first questions he asks is 'How many votes do you control?'

Management must realize that it is a minority. And large masses of voters pick these legislators on emotional fallacies. Why? Because industry has failed to explain to the voters the fundamental rules of business so they can recognize their own stake in maintaining our system."

Industry must get active on the local level to reverse the downward trend, advises Mr. Gapp. It must clearly tell its story to, and improve its relations with, the community. It must encourage and train its employees as well as management to hold local public office.

Members of the AMA seminar also heard from speakers on some specific programs that are to some degree successful. There were wide differences in circumstances and industries. But several similarities kept forcing attention.

One is the value of the practical political workshop. This has been tried in Ohio by Warner & Swasey Co.; in Louisville, Ky., by Brown-Forman Distillers Corp.; and in Detroit by Detroit Edison Co. In each case the problems were different. But in all cases a more enlightened mass of voters helped alleviate a situation, at least partially.

What's Industry's Best Plan?

Industry must tell its story, politically, if it is to survive. Spesialists who addressed the American Management Assn. seminar on industry in politics agreed on this principle. But they disagreed on the best approach.

Joseph Eley, speaking to the New York meeting, noted:

"Every multi-unit corporation should have a full time representative in Washington. And smaller companies should team up to get a spokesman. Further, more attention should be given to state legislatures.

Starts at the Top — "This job should be given only to someone who knows politics and legislative procedures very well. And he should, from time to time, brief top executives on the issues and the positions that should be taken.

"Also industry should provide more business executives to testify before both the national and state legislatures."

. . . Or the Bottom—But Donald Gapp saw it another way:

"Management is a minority group. Whatever it says in the political arena is going to be used against it in years to come.

"Also, the first question a legislator will ask an industry spokesman is 'How many votes do you control?' The answer must be almost none, so there is almost no chance for his support.

"Industry's stake is in the quality, not quantity of voters. Industry should enter public affairs, not politics—and on the local level. In brief, industry must infiltrate community life."

DISTRIBUTORS' VIEW: Meeting of SKF Industries Distributor Council discusses mutual manufacturer-distributor problems. SKF officials present are: D. B. Eden, director of distributor sales (left); J. H. Sutherland, director of sales (third from left); and S. H. Smith, vice president of sales (right).

Distributor Aid Plan Pays Off

Developing a sound, strong, distributor network is a challenge for any manufacturer.

SKF Industries found an answer: A council controlled and directed by its distributor members.—By P. J. Cathey.

▪ Three years ago SKF Industries, Inc., makers of ball and roller bearings, set up a council of its distributors. Its aim: Getting the distributors' viewpoint. Keeping them more closely in touch with SKF policies and marketing programs. Working with them in solving mutual problems.

Questions Asked—The results so far have been impressive. Typical are these:

At one meeting a distributor asked, "A customer phones me and wants a replacement bearing. He reels off a series of numbers stamped on the bearing. I don't know what the numbers mean."

An SKF sales executive answered, "Those numbers are manufacturer's code or internal part numbers. They're helpful in identifying the customer's requirement. Let's see what SKF can do to simplify the problem. Then, if a customer tries to order by our code, you'll know what he's doing."

As a result, SKF now issues its internal code system to all distributors, putting them in a better position to serve customers.

At another meeting, a distributor pointed out his customers were anxious about delivery of bearings shipped by air freight. Could SKF help eliminate confusion about which flight was used and when the shipment would arrive?

Streamlining—Now when emergency shipments are made by air freight, SKF advises the distributor about the airline used, the flight number, departure and arrival times, and the freight order number.

Discussion at the meetings has helped cut down paperwork. Distributors pointed out a large number of invoices were needed on multiproduct orders.

To simplify ordering SKF now lists 17 bearing sizes on one new invoice form. The company also changed internal office procedures so distributors get monthly statements in ample time to take advantage of SKF discounts.

Marketing Advice — Marketing policies and sales budgets are thoroughly studied at the meetings. If a new catalog is planned, SKF asks distributors for their reactions. The company tells council members how much SKF can spend on distributor promotion programs. SKF sales officials then pose the question: "If this budget was yours, how would you allocate and spend it?"

Company officials are convinced the key to the council's success is its organization. Even before the first meeting in May, 1957, they decided the council would not be company dominated or directed. And the organizational setup shows it isn't.

Operating Policy — There are eleven members on the council. Eight are distributors selected from the more than 270 SKF distributor outlets. Two are chosen from each of the company's four regional sales districts. Four new members are elected each year, with four remaining on the council.

There are three permanent SKF representatives on the council—the director of distributor sales, the director of sales, and the vice president of sales. From time to time, other SKF officials are brought into discussions, if the distributors request it.

Final decisions on all operations are in the hands of the distributors. The SKF members have no voting rights. Distributors decide what subjects will be discussed and make up the agenda for the twice-yearly meetings.

Ample Feedback — Distributors not on the council receive complete reports of all the meetings. And they are asked what subjects they would like to have discussed.

SKF is satisfied the council has successfully opened up lines of communuication to and from distributors. Stuart H. Smith, vice president of SKF's sales division, explains it this way, "The council came about because we realized the manufacturer - distributor relationship is not a one-way street. We were not getting fed back the information needed to build the type of program distributors needed. Their problems were too far away and our thinking got diluted before it reached them."

Trade-Aid Plan—Flow of knowledge is no longer a problem. Council discussions have even led SKF into a new venture to strengthen distributors—a trade-aid plan.

Under this program the company offers all its staff services to authorized SKF distributors without charge. Specialized help is available in any corporate service SKF uses—aid and counsel on insurance, promotion, public relations, finance, training, organization development, labor relations, compensation, safety and health.

Reach for the Phone—Thomas F. Morris, SKF vice president, industrial relations, who devised the plan, points out its benefits. "The trade-aid program puts the SKF specialist just a phone call away from either the small or large bearing distributor."

New Machine Permits Micro-Look at Steel

▪ A new tool, permitting micro-inspection of steel and steel products, has been developed for use by Jones & Laughlin Steel Corp. metallurgists.

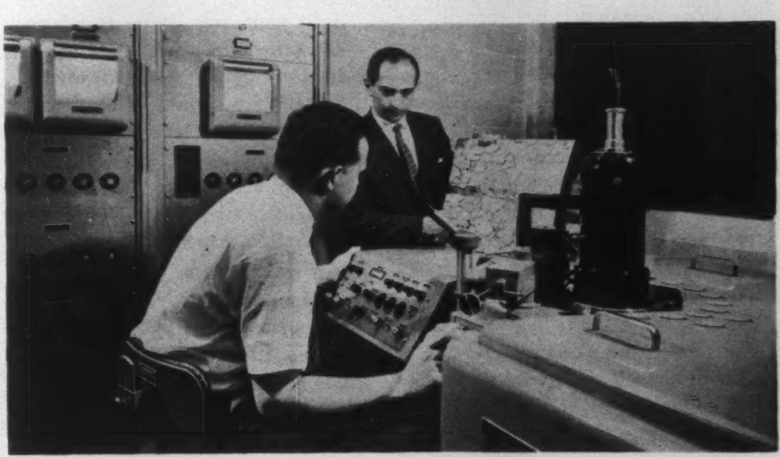
The new instrument, an electron probe microanalyzer, is a recent development for detailed studies of minute regions which could hold the key to new and better steels, says Dr. H. S. Turner, J&L's vice president, research and development. It will permit investigation of areas so small that it would take 250 of them to span the thickness of a razor blade.

Big Advance — Dr. Turner says there is little doubt that the new tool "represents a very important technological breakthrough in chemical analysis of steel." It makes possible the combined study of microstructure and chemical composition for the development for new products as well as for increased quality control.

The new technique does not alter the sample or its surrounding structure and is far more selective than even the best microchemical method, says Dr. Turner. "For the first time the steel metallurgist can determine the exact composition of a minute segment of steel in its natural or original place and can detect the changes in chemical composition from one microscopic grain to another which have occured during solidification, in subsequent processing, and in heat treating."

The Process—The principle involved in the electron probe microanalysis is that the high energy electron beam of the equipment excites X-ray emission from atoms within the region under examination. By means of crystal analyzers and Geiger counters, the radiation can be measured and amounts of individual elements determined.

The tool makes it possible to perform a quantitative analysis on an area so small that it is barely visible on a microscope.



UNDER STUDY: Dr. I. I. Bessen, Jones & Laughlin Steel Corp. assistant director, physical and mechanical metallurgy, right, shows research metallurgist Paul Lane a steel sample to be studied by J&L's new electron probe analyzer. New tool may lead to better steel products.

If You Are Not Advancing, Take a Hard Look at Yourself

By **Dr. F. J. Gaudet**—Director, Laboratory of Psychological Studies, Stevens Inst. of Technology

Many are unwilling to pay the high price of bigger executive jobs. Or, maybe you do have the "stuff" but are in the wrong company.

Wives play a bigger part in executive success and failure than most realize.

▪ If you are dissatisfied because you are not advancing in your company, there are a number of questions you should ask yourself.

Do you really want to advance? Many people do not.

There was a chemical engineer, for example, whose company was looking for a chief chemist. One of the vice presidents personally interviewed every chemist in the company and, in addition, had all of them evaluated physiologically. The chemical engineer in question rated highest and was offered the promotion. Much to the disgust of the vice president, he turned it down.

Why? Simply because the engineer liked what he was doing and didn't want the additional hours and responsibility the promotion would bring. He owned his own home, had a flower garden in which he took great pride, owned a power boat, had insurance to see his children through college and, in general enjoyed the life he was leading.

Was he a man completely satisfied with himself and therefore probably stagnating in his job? No, he **was** advancing—in his own way.

Promotions Refused—The extent to which men at all levels of management refuse promotion is not known, but it happens very frequently. Recently, when ten men were interviewed for promotion to a top level position in General Electric Co., six were told they were definite possibilities for the job and to "think it over." All six, after considerable soul-searching, turned down the opportunity.

NEXT WEEK

Help Yourself To Move Ahead

In Dr. Gaudet's third and last article in this series he offers a personal program to help you move ahead.

He explodes old notions. He shows that additional schooling and more experience in your present line can hold you back—not advance you.

Is it your own desire to advance—or someone's else's? Quite a few men don't really want to advance, but feel they should. This seeming contradiction is best explained by the fact that some people find it easier to accept the values set by others than to stick to values they have set for themselves.

An investigation that is going on at one of our Air Force bases has already shed some light on the matter. Labor turnover among the hundreds of engineers employed at this base is very high, and the investigation was ordered to find out why the engineers quit their jobs.

Real Reasons — The pay-off in unearthing "real" reasons didn't come until investigators began interviewing the wives of the quitting engineers. Then it was revealed that although the engineer may have already been promoted to a project engineer, or even made chief of a section, this was not the kind of a promotion that his wife could see as a "real" promotion. When the man down the street was elevated from assistant foreman to foreman, **that** she could see as a definite step up the ladder.

Once a project engineer or section chief discovered that not only his own wife but practically everybody in the neighborhood considered him to have less status than a foreman, he became dissatisfied. He, too, wanted to advance and advancement, to him, now meant getting into line management.

Are you willing to pay the price for advancement? The man who wants to go to the top must be willing to give up a great deal in return for the rewards he expects to receive.

The moment he enters even the lowest levels of supervision, a man gives up the luxury of a thirty-five- or forty-hour week. The higher he goes, the longer his working hours. A sixty-hour week is not uncommon for an executive and this doesn't even include the paperwork he carries home with him.

There is also the likelihood that an executive will spend much of his time away from home. Travel is commonly a necessity for top management people.

High Price—Talk to top executives, even those who are clearly satisfied with their jobs, and you will frequently get a picture of the tragic price they pay to hold those jobs.

One example of this is seen in top management men who speak wistfully of the time of their retirement—when they will finally be able to spend some time with their children. These men are apparently so blinded by their preoccupation with business that they do not realize their children will be grown up by that time!

If you are not advancing, why not? Granted that a man really wants to advance and is willing to pay the price for it, what is it that may be standing in the way of his advancement?

His company may not be growing. In this case, nobody is being promoted.

Or, whether the company denies it or not, promotions may be taking place almost entirely on a seniority basis. Utilities, banks and railroads follow the seniority policy more frequently than does the average business.

In some companies, men are promoted more rapidly in certain departments or divisions than in others. In a company which is primarily a sales organization, even though it manufactures its own products, the manufacturing man or the engineer will rarely move from the plant to the home office. But in a company where manufacturing produces the real profits the men who get to the top are manufacturing personnel, particularly engineers who started out as foremen.

But suppose your colleagues in your own department are being promoted and you are not. What do your friends have that you lack? Do you actually know? How objective are you in your evaluation of your fellow workers and yourself?

Know Reasons—Certainly, when an ambitious man is being passed over by the company, he should be told the reason, or reasons, why. Very few companies do this, however, and a common complaint among employees at all levels in American industry is that they are not told where they stand. As a result, a man will set up his own standards of measurement.

When a company does not tell an employee why he is not advancing, he certainly has the right to ask for the reasons. And in almost any company, if he handles the situation skillfully, he can learn the reasons why he is being by-passed.

If your company has opportunities for advancement, how can you best take advantage of them? For many years, industry recruited its foremen from its most skillful or most productive workers. Some companies still do. But a major change is taking place. More and more companies are beginning to realize that different skills are required for management positions than are required for non-management ones.

What top executives are searching for is evidence of leadership.

Are You Willing to Pay the Price?

Ask Yourself These Questions:

1. Company presidents put in an average of 50 hours a week on the job and bring home 20 hours of work each week.

   Would you be willing to do this?

2. Top management men spend only 20 to 40 hours a week with their families. (Including weekends and meals).

   Would you be willing to do this?

3. Vacations of executives are usually taken in lengths of a week or less.

   Would you be willing to do this?

4. Lower and middle management men often have to move their families from one part of the country to another every three or four years.

   Would you accept this?

5. **Are you willing** to fire your friends if their work is not satisfactory or doesn't meet standards?

6. Surveys show management men live near and associate with people at their own management level.

   Are you willing to give up your friends as you go up?

7. As you go up the scale of management, competition becomes more intense.

   Can you climb over the backs of competitors to get where you want to go?

8. **Are you willing** to put your job ahead of your family?

9. **Are you willing** to spend two or three evenings a week away from home?

10. **Are you willing** to let your wife see how you answered these questions?

Evidence of Ability—Actually, it is no problem for a man to demonstrate his ability to lead. Leadership is needed and will be welcomed in the civic groups of his community, in his church, parent-teacher organizations, or in any other of the numerous activities available to him in the average American city or town.

Finally, there is considerable to show that the dissatisfied employee is usually unhappy, not just about his job, but about his life in general.

Actually, it is the **degree** of dissatisfaction that a man feels that is important. The totally satisfied individual who wants things to stay as they are stands in danger of stagnating. The totally dissatisfied individual is to be pitied. But it is probably lucky for any of us to be a little dissatisfied — to the point of doing something.

Changing Environment — Most people don't realize, however, that in order to remove dissatisfaction from our lives we must usually make some changes in our behavior. Most of us, being human, tend to ascribe our dissatisfaction to our external environment. But even when this is the case, something has to be changed before the dissatisfaction is removed. And we have only three alternatives: To change the environment (which is usually impossible), to get out of that environment, or to change ourselves so that the environment affects us differently.

"Environment" is largely the people around us and what they do or don't do day after day. This is the part of environment that almost always accounts for an individual's satisfaction or dissatisfaction with his job or his life in general.

So, the man who is dissatisfied has the practical choice of either quitting the company or altering his relations to the people who make up his environment.

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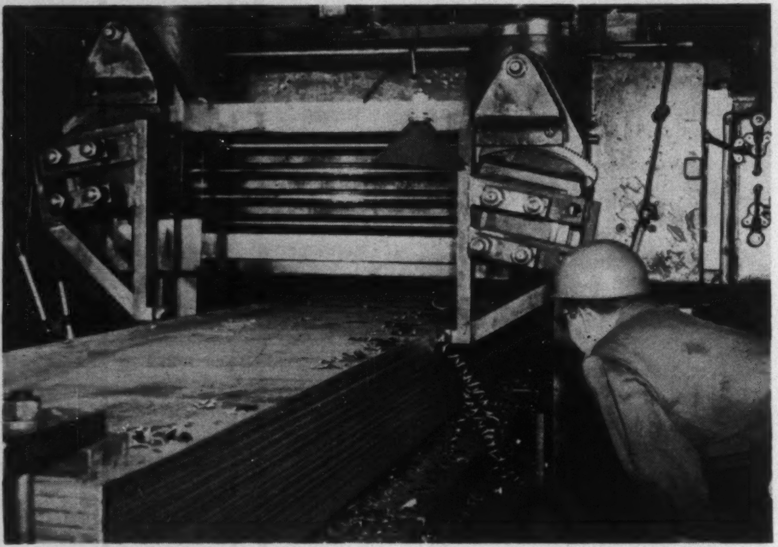
Steel Plates Head for "Race Track"



THEY'RE OFF: These carbon steel plates, being edge-machined at Lukens Steel Co., Coatesville, Pa., are part of a 5500 ton order destined to become the heart of the Argonne National Laboratory's new "atomic race track," the Zero Gradient Proton Synchroton.

Plates Shipped For Reactor

First shipments of carbon steel plates that will form the heart of Argonne National Laboratory's $29 million "atomic race track" began this month by Lukens Steel Co., Coatesville, Pa.

The plates are being sent to Baldwin-Lima-Hamilton Corp., Philadelphia, where they will be fabricated into a ring of eight steel magnets weighing more than 600 tons apiece.

Lukens is melting, rolling, shearing and gas cutting, flattening and stress relieving nearly 40,000 plates for the project.

Each of the eight magnets, or octants, in the atom smasher will consist of 10 center and six end blocks. In turn, each center block will be made up of two poles of 93 of the Lukens plates. The plates for each center block must be produced from at least four different heats because of electrical flux requirements.

Tough Bargaining

Unions are finding it tougher to get wage increases as the year goes on. At least according to figures of members of the Associated Industries of Cleveland, an employers group.

Weighted average increase to date for 151 companies covering 43,185 employees is 6.9¢ per hour, not including fringe or cost-of-living benefits. At mid-year, the average was 7.19¢.

Of the 151 companies involved this year, 28 have cost-of-living clauses.

Tax Cut Possible If Law Overhauled

U. S. Treasury officials predict "we can and will have a general tax cut."

Treasury Dept. Under Secretary Fred C. Scribner said that tax relief will come in a comprehensive tax bill and not piecemeal. Such a tax bill is expected in Congress next year.

Scribner said special piecemeal legislation "can only postpone the day in which a general tax cut becomes effective." This again points up the fact that the U. S. will have no tax relief unless the whole tax structure is revamped.

Coupling a billion horsepower

Fast's Couplings are the choice of more industrial equipment manufacturers than any other gear-type coupling. Added fact: The Fast's line is more complete, with more applications. So it takes no more than a conservative estimate of total horsepower ratings to pass the billion mark.

Reasons for this popularity? Every Fast's Coupling brings you superb engineering only the original gear-type coupling can deliver. Smooth-running units that are designed to outlast the machines they connect. Rapid service from experienced field engineers backed by outstanding stock facilities.

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NO CORROSION ON STRIKE-BOUND STEEL KEPT BRIGHT WITH FERRO-PAK® BY CROMWELL

For 116 days one of the largest producers of steel held thousands of tons of polished steel—unable to move it because of the strike.

Most of this plate was covered with Cromwell Paper Company's Ferro-Pak VCI paper—the packaging paper that provides an invisible protective film of chemical vapors to guard against rust. Through hot days, cool nights, weeks of sultry, steamy weather, the steel was protected. When the paper was removed, there was no edge rust. The steel was almost 100% rust-free.

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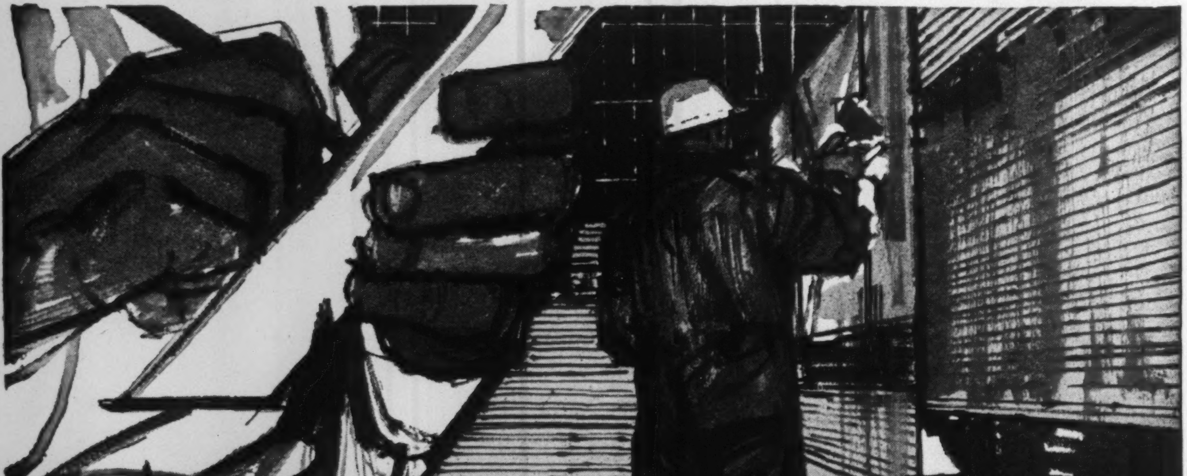


Will Economic Patterns Repeat?

Don't rely too much on past business patterns and seasonal trends in predicting future developments.

Previous patterns are growing indistinct and new ones are varied and complex. Many new forces influence trends.

- In predicting future business trends, don't relay too much on past performances.

Previous economic cycles and seasonal trends may be helpful in forecasting what's to come. But they have serious limits. The reason: The old patterns aren't as definite as they were. And the new patterns aren't clearly defined as yet.

The New Factors — There are many complex forces at work influencing U. S. economic trends. To name a few: Rapid changes in technology. Expanded industrial capacity and its impact on inventories. Increased spending for services and non-durables. Longer-term labor contracts. Growing employment in salaried "blue collar" jobs, while production jobs hold steady or decline.

What happened after last year's steel strike shows how these new factors can scramble predictions. A long-term demand for steel was expected when the four-month shutdown ended.

Fast Recovery—But steelmakers put the industry's record capacity of 147 million tons to work and quickly caught up on backlogs. Then steel users, finding their own sales tapering off, began cutting back inventories. And the steel sales slump began.

Now, with steelmaking capacity ample, buyers are using a new ratio of inventories to sales. Use of electronic data processing equipment and other methods of improved inventory control are also changing buying patterns.

Peaks and Valleys—In any case, it's unrealistic to expect the steel industry to operate at top capacity month after month all year long. In the years before World War II, the operating rate varied all the way from 50 pct to 90 pct of capacity. Output usually reached a peak in March. After a slow summer, there was generally a secondary buying wave in October. Only in recent years has the operating rate remained consistently in the high 80s and 90s.

Steel labor contracts are a major factor in any violent ups and downs that do occur. As the old contracts run out, users keep mills busy by buying against a possible strike shutdown. And if a strike does come, another buying wave follows afterwards.

Spending Patterns — Other econonic changes—increased spending for services, more salaried workers on the payroll—could dull the impact of a recession. Since the second quarter of '59, for example, consumer spending for durables has remained at a seasonally adjusted annual rate of about $44 billion. But purchases of non-durables climbed at a rate of $5.8 billion and spending for services rose more than $9 billion.

Don't Waste Research Funds

- Are metal producers and metalworking companies spending enough on product and process development?

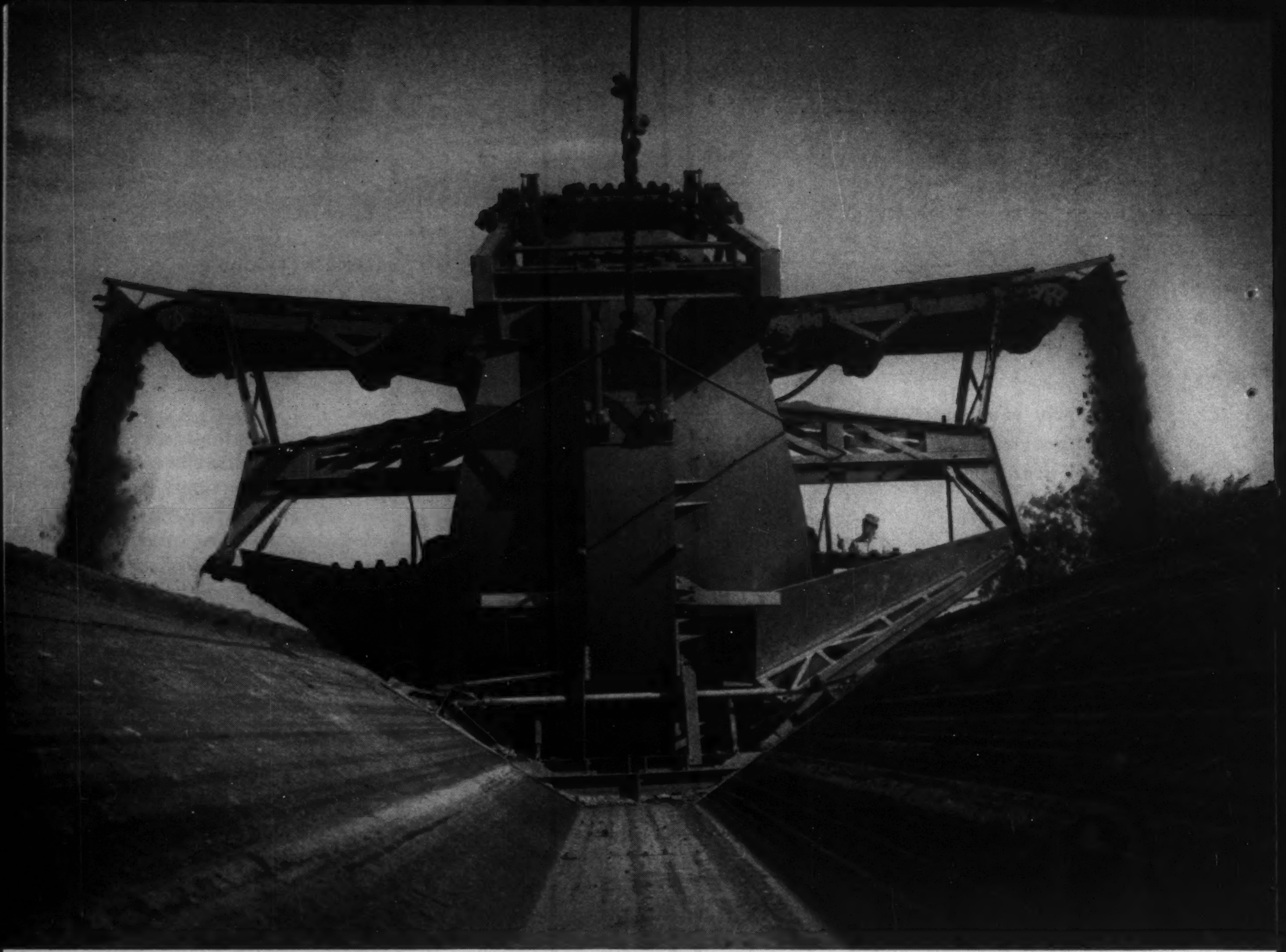
A new survey by the American Management Assn. shows they are investing substantially, but lag behind some other industries. The average budgeted for product development last year by the 402 companies surveyed was 3.7 pct of sales.

How They Compare — Among industries below this average were steel (1.6 pct), nonferrous metals (2.1 pct), metalworking machinery (2.3 pct), fabricated metal products (2.4 pct), and electrical machinery (2.7 pct).

Industries above the average included electronics (7.7 pct), instruments and control equipment (6.1 pct), and pharmaceuticals (5.7 pct).

Study Needed—Product development costs could stand close management study, based on the results of the survey. It showed most corporations don't know the actual cost of developing new products. In addition, the majority aren't organized to absorb and use the knowledge gained.

Says the AMA: "If there is any single starting point in planning for growth it's in better management of technology—in turning ideas into dollars. While the life blood of many industries is new product development, there is no magic in research or in developing new or improved products if the process wastes money."



World's fastest ditcher...rugged proof of M&T Murex electrode welding quality

In one minute this monster machine carves out seven continuous feet of ditch 6′ deep, 4′ across, at the bottom, 22′ across at the top. Working at top capacity of 800 cubic yards of earth an hour, the ditcher could keep a large fleet of dump trucks mighty busy. Gar Wood Industries relied on M&T Murex electrodes to give the ditcher's all-welded frame the brute strength needed to do its Herculean job.

It's a vote of confidence in the quality of Murex electrodes and M&T service when one company after another singles them out for the important welding jobs. Super tanker . . . world's largest power shovels . . . welded buildings . . . award winning bridge—these are some of the many other outstanding jobs done with Murex electrodes—where their performance in the hands of the weldor and in the working product explains their fine reputation among engineers and production men everywhere.

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Chrysler Stresses Small Cars

Company Hopes Ride on Low Priced Models

Chrysler is facing up to a double set of problems this year. L. L. Colbert, Chrysler chairman, has denied reports concerning new executives.

But the automaker unleashed the campaign for a big share of the 1961 low-priced market.—By A. E. Fleming

▪ Chrysler Corp. faces a double problem this year.

First, it has to square the record with the public following the dismissal of former president W. C. Newberg, and in the face of investigations of executive practices.

Next, it has to get down to the business of improving its status in the Big Three with the sale of its 1961 models.

Last week, while Hurricane Donna threatened Miami Beach and the national press preview of 1961 models, the company moved on both fronts.

Chairman L. L. Colbert first denied rumors that the naming of a new president and several board members is in the works. Then, he said, "We're taking steps to make as certain as we can that there are no conflicts of interest on the part of Chrysler personnel."

Next Year's Goals — Reporters, apparently as tired of the issue as embattled Mr. Colbert, didn't even follow up the issue. Instead, they were more interested in company goals for the next year.

There is little doubt that Chrysler's money will again ride on low priced models. The Plymouth Valiant line has been expanded to include two-door sedans and hardtops. The new Dodge Lancer is ready for the sales race with Buick, Oldsmobile and Buick compacts. Also, the standard Plymouth, Dodge and Dart have undergone a vast facelifting job.

There is good reason for the focusing of Chrysler's attention on the low price market. Cars in this category are now capturing 75 pct of the consumers, an increase of 20 pct from 1955. And, automakers expect it to rise to 80 pct next year.

Small Cars Too—Chrysler is also putting emphasis on the small car market. Mr. M. C. Patterson, general manager, Dodge Div., notes, "Demand for smaller cars has grown tremendously in the past year and will keep growing."

Mr. Patterson predicts that U. S. compacts will expand from 25 pct to 35 pct of the new car market in the next year. He says the Lancer is marketable because there is a need for more than plain economy in the compact field.

He points to the 1960 model year when over 70 pct of all compacts sold were the higher cost deluxe types. More than half had automatic transmissions.

The 170 and 770—The Lancer will be available in six body styles in two series. These include a low priced 170 series with a two-door sedan, four-door sedan, and four-door station wagon; and a deluxe 770 series with a two-door hardtop, four-door sedan, and four-door station wagon.

Meanwhile, Valient's only new features include a new grill texture and side molding and prominent molding atop the rear quarter panel.

Dodge Lancer Enters Small Car Field

WATERPROOF: A 1961 Dodge Lancer, new entry in the small car field undergoes water tightness test at Chrysler Proving Grounds near Chelsea.

Another MX Test System at work...

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TESTING

A Magnaflux Type "N" Test Unit used for checking the quality of all chemical and medical tablet press punches at the Arthur Colton Company.

8 Out of 10 Plants Need Only this One Unit to Handle All Magnetic Particle Testing

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Standard adapters and jigs, automatic magnetization and processing, even conveyorized handling, at small extra cost.

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Farwest Widens Product Range

Trend to New or Enlarged Plants Continues

There's little letup in the industrial growth of the West Coast area.

Here's latest list of new companies or those expanding facilities.—By R. R. Kay.

■ The Farwestern economy continues its day-to-day plant expansion. Hardly a day passes without word of new or enlarged facilities.

It's been that way for over 10 years. And there's no sign of a letup. Here are some of the latest moves—a mixture of old and new names, and an ever-widening product base.

Aircraft and Metals — Around southern California:

Otis Elevator Co., a 150,000-sq-ft plant in Cucamonga. Convair-Astronautics Div. of General Dynamics Corp., a million-dollar electronics manufacturing facility in San Diego.

Metallurgical Consultants, Inc., Montebello—furnace brazing and metal processing. Pacific Telephone & Telegraph Co.—$3.5 million for expansion in the San Fernando Valley.

Norden Div. of United Aircraft Corp., Costa Mesa—numerical controls. Aeronutronics Div. of Ford Motor Co., Newport Beach—aerospace research and development plant, $1.4 million.

Instruments and Reactors—Beckman Instruments, Inc., Fullerton—industrial and scientific instruments. Hughes Aircraft Co., Fullerton — more room for ground systems division. International Plating Corp., Anaheim—metal finishing.

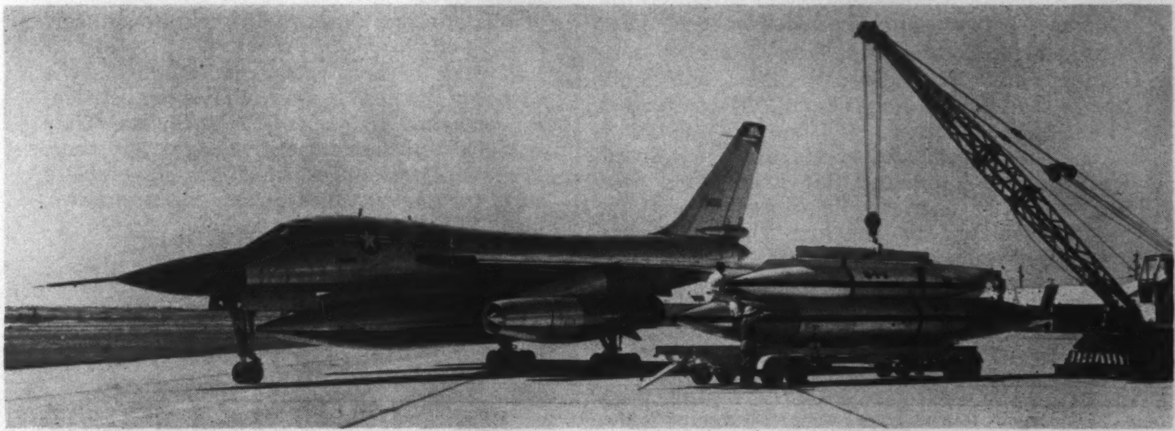
Glowing Devil, Alhambra—restaurant equipment. Star Wire Screen & Iron Works, Inc., City of Industry — wire cloth. Atomics International, subsidiary of North American Aviation, Inc., Canoga Park—design and manufacture of nuclear reactors.

Dyna-Therm Chemical Corp., Burbank—high temperature coatings. Cromwell Business Machines, North Hollywood — adding machines. Ormond Instrumentation Center, Inc., Santa Fe Springs — stress analysis equipment and transducers.

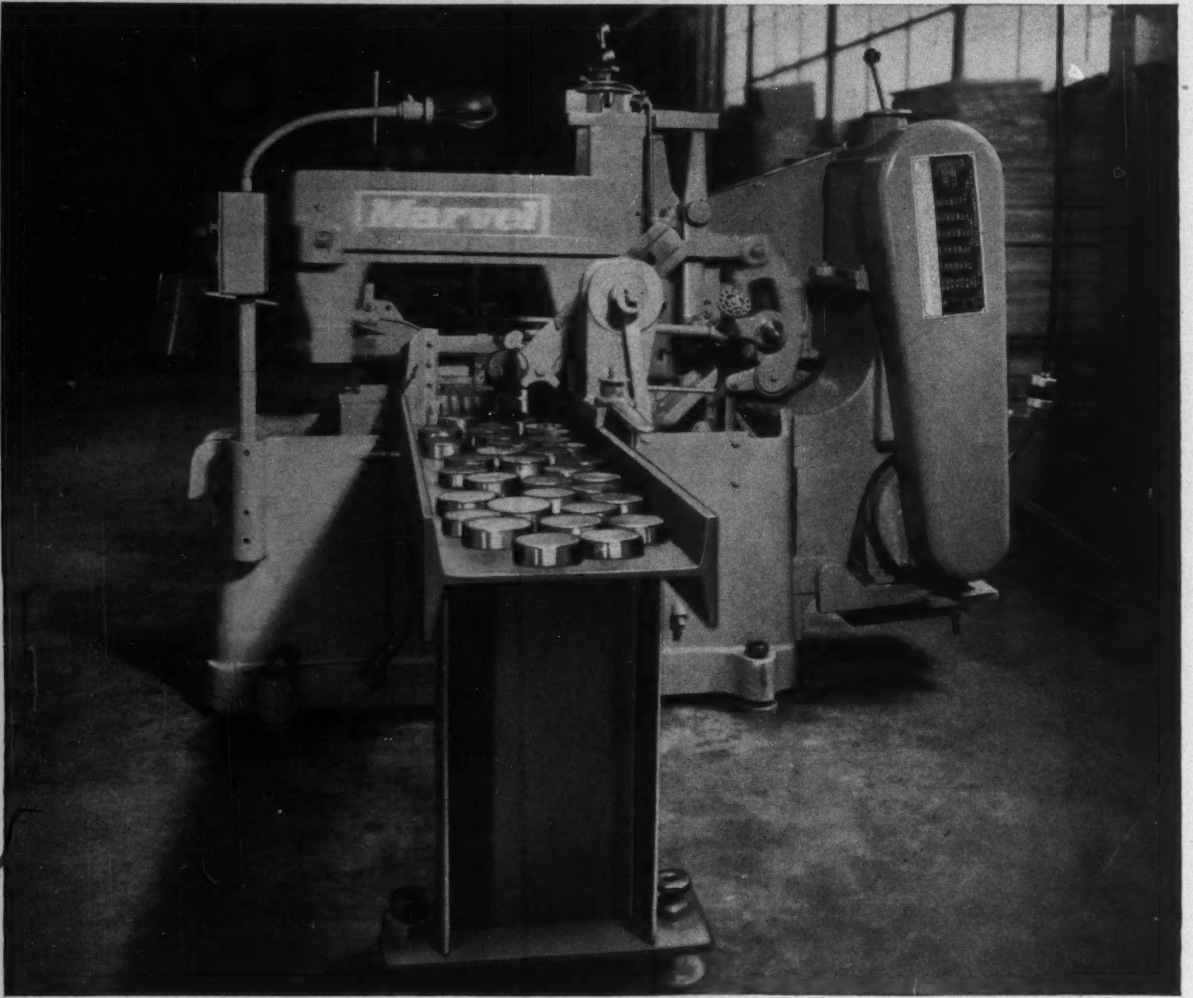
Auto Assembly, Air Conditioners — Recold Corp., Los Angeles — refrigeration and air conditioning products. Nalpak Corp., Huntington Park—material handling equipment and industrial wheels. Electronics Div. of National Cash Register, Los Angeles—data-processing systems. Motorola, Inc., Culver City — controls for communications and navigation.

Buick - Oldsmobile - Pontiac Assembly Div. of General Motors Corp., South Gate — more auto assembly space. Rooke Engineering Co., Sun Valley — fasteners. Reynolds Printasign Co., Pacoima —automatic signmaking machines.

Piggy-Back Pod Increases Hustler's Range



USE, THEN DROP: Weapon-carrying pod is fitted in place on top of fuel-carrying lower pod on Convair's B-58 Hustler supersonic bomber. Lower portion of the two-part unit can be dropped after its fuel is used.



Payoff End of a Production Marvel

A cut-off saw's value is proven at the discharge end of the machine. How quickly the trough is filled with accurately cut-off pieces can mean the difference between profit and loss on many jobs.

The R. J. Sudrick Co., Des Plaines, Illinois, manufacturers of precision aircraft components had to cut-off 4600 blanks from 3¼″ round, 303 Stainless Steel Bars.

They bought our MARVEL No. 6A4 High Speed Heavy Duty Automatic Bar Feed Hack Saw Machine; used MARVEL High-Speed-Edge Hack Saw Blades, and got the high production, accuracy and economy they desired.

PRODUCTION?	Constant at 20 pieces per hour floor to floor
ACCURACY?	Held well within the permissible tolerance of +.010 —.000
BLADE COST?	Just 1½¢ per cut. Only twenty-three MARVEL blades were needed to make the 4600 cuts, and not a single blade failure due to blade breakage. MARVEL High-Speed-Edge Blades are unbreakable.

The point is this: MARVEL Metal Cutting Hack Saws equipped with MARVEL High-Speed-Edge Hack Saw Blades are an unbeatable combination for economical, accurate and safe cutting-off.

If your hack saws are not producing the economy you need to meet today's competition, try MARVEL High-Speed-Edge Blades. They will give you the competitive edge every time. Write for Catalog C-85 which has the complete story on MARVEL Hack Saws and Band Saws, Hack Saw Blades and Band Saw Blades.

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Industry Can't Afford to Lag

Increasing world competition is pressuring U. S. industries into revamping practices.

An industrial leader warns depreciation laws must be revised.—By R. H. Eshelman

▪ If U. S. is to compete effectively in the world industrial race, it must reform present industrial practices.

This is a warning from Rudolph Bannow, president of the National Assn. of Manufacturers, and chief executive of a Bridgeport, Conn., machine tool company. The warning was issued at the annual meeting of the American Machine Tool Distributors' Assn. in Chicago.

Mr. Bannow notes that American industry "faces a new world tooled up with the best equipment." He points out inequality of production floor wages between the U. S. and other countries.

Need New Laws — Also, "We need to revise our antiquated laws on depreciation of equipment. We still retain rules that call for periods up to 20 years, while manufacturers abroad depreciate their equipment in five years."

The result is that the U. S. faces a competitive problem which challenges industry to design the best equipment and create the most modern methods. More important, says Mr. Bannow, is the need to develop the knowledge and understanding of this problem among production workers. Then, new equipment and methods could be utilized to the full potential.

"Only in this way can we hold our own in a world where sharp competition is developing rapidly. If we are to be successful as a nation, let us take the brakes off the jobmaker, free the creative spirit, and move forward."

Relations With Public — At the same meeting, G. T. Richardson, a public relation counsel, hit the human side of the problem.

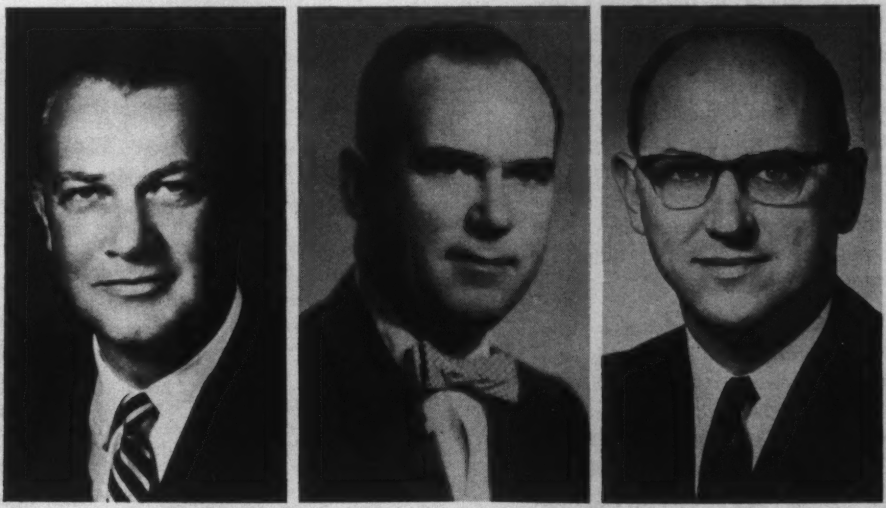
He claims the industry faces an uphill fight until the people understand machine tools. He reminded the distributors that there are industries with more surface glamour, and with statistics which impress the man-on-the-street.

But Mr. Richardson warns against selling machine tools short. "They create new products, jobs and opportunities. They are the key to peacetime prosperity and wartime survival."

However, he emphasizes that the effect of new machines on labor is the important area to cultivate. "Right at the grass roots, the industry needs to sell labor on the true value of modern machine tools. It's too late when labor leaders decide to oppose installing cost-saving machines."

Machine Tool Distributors Elect Officers

TOP MEN: George E. Merryweather, far left, was elected president of the American Machine Tool Distributers' Assn. at the associations 36th annual meeting.



Other officers elected, left to right: I. B. Rabel, vice president; C. Denson Day, second vice president; and William L. Walker, secretary-treasurer.

INDUSTRIAL BRIEFS

Half Million for Hafnium—Nuclear Materials & Equipment Corp., Apollo, Pa., has a $550,000 contract by the U. S. Atomic Energy Commission to produce ultra-pure hafnium metal. The hafnium will be used as a control material in connection with the AEC's naval reactors program.

80 Pct More—Additional manufacturing and general office facilities are now under construction for Hydro-Line Mfg. Co. It will represent an 80 pct increase in space for the Rockford, Ill., manufacturer of precision air and hydraulic cylinders. Total cost for the expansion is about $80,000.

Overseas Outlets — Aluminum Co. of America acquired the foreign rights to sell and license the manufacture of Sonobond ultrasonic metals joining equipment from Aeroprojects, Inc., West Chester, Pa. Ultrasonic joining tools manufactured by Sonobond Div., subsidiary of Aeroprojects, Inc., are used to weld, braze, and solder metals by the application of ultra-high frequency vibrations.

Cotton Country—Fulton Industries, Inc., Atlanta, Ga., has purchased American Buildings Corp., Columbus, Ga. It will be operated as a division of Continental Gin Co., Birmingham, Ala., which is one of Fulton's subsidiaries. Continental Gin will use the design and engineering facilities of American Buildings for the construction of gin buildings, cotton warehouses, seed storage buildings and industrial plants.

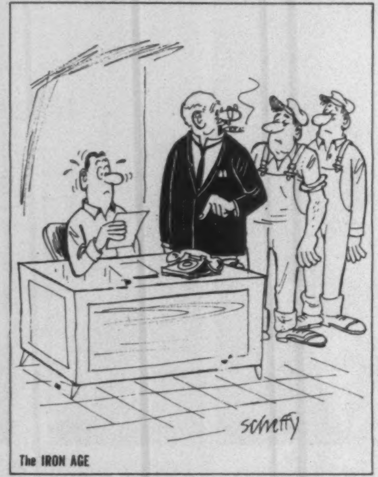
Philadelphia Expansion — Edgcomb Steel Co., Philadelphia, has purchased property and buildings at "B" St., below Erie Avenue recently occupied by the Globe Battery Co. Purchase price was $300,000. The newly acquired property will supply additional space for the stocking of metals. It will be occupied early in 1961.

More Aluminum for Cans—Aluminum Co. of America is expanding its Richmond (Ind.) works to meet the rising demand for aluminum caps and seals for container use. Construction of additional production facilities for producing closures, and a modernization of some existing facilities, will begin immediately.

Phased Out — Avco Corp. changed the name of its Crosley Division to the Avco Electronics and Ordnance Division. The Crosley Div. name long has been associated with a line of consumer items which is no longer produced. Today the division is engaged in the design, development and production of electronics and ordnance items for the armed services.

Spreading Out—Metal & Thermit Corp. expanded its activities in the minerals field by acquiring the resources and facilities of Orefraction Minerals, Inc. The purchase price was about $1 million. Orefraction Minerals, with facilities in Andrews, S. C., supplies granular and dry milled zircon.

AEC, NASA Form NPO—The Atomic Energy Commission and the National Aeronautics & Space Administration have established a joint Nuclear Propulsion Office (NPO). It will be located at the AEC Headquarters at Germantown, Md. H. B. Finger, chief, Nuclear Propulsion for NASA, was named manager. The Deputy manager will be Milton Klein who has been asst. manager, Technical Operations of AEC's Chicago operations office.



"Here's another one we're through with."

New at the Soo—Algoma Steel Corp., Sault Ste. Marie, Canada, placed a contract with Dominion Engineering of Montreal for a 6-stand wide strip mill. It will produce hot-rolled steel sheets and light plates to a maximum width of 96 in. Estimated to cost $30 million, this mill is planned to be financed internally and will require several years to construct.

Prefabs for Airport—Sphere, Inc. and Tyson Steel Building Co., Fort Worth franchised dealer for Inland Steel Products Co., signed a contract for the purchase and erection of 26 prefabricated Inland Steel buildings. It is part of the actual construction of an $8 million private airport for business and executive aircraft in Fort Worth, Texas.

Chicago Move — Milwaukee Crane Div., Novo Industrial Corp., moved its Chicago district sales headquarters to 9705 Cottage Grove Ave. Previously, headquarters were at 53 West Jackson Blvd., Chicago. Milwaukee Crane produces standard and custom-built heavy-duty cranes and welded bridge spans.

Powerful Oxygen—Construction of an oxygen converter plant in Pueblo, Colo., will include the installation of a 1500-kw Allis-Chalmers mercury arc rectifier unit substation. It will furnish 250-volt dc auxiliary power and a 1500-kv load center unit sub for 480-volt auxiliary power.

Merging, Converging—Operation of the Alloy Manufacturing Corp., Horning, Pa., and its Freitag Div. at Akron, O., will be consolidated into the operations of Salem-Brosius, Inc., Carnegie, Pa. Headquarters for the companies will be at the company's offices in Carnegie, Pa.

Anneal 430 Trim Stock and All Other Stainless Strip to a Durable, Mirror Finish Without Chrome Depletion in

THE ELECTRIC **EF** FURNACE CO.
GAS • OIL • ELECTRIC

Continuous *Stainless Strip Bright Annealing* Furnaces

Check these outstanding advantages

✓ **DESIGNED AND BUILT BY THE WORLD'S MOST EXPERIENCED BUILDER OF STAINLESS STRIP BRIGHT ANNEALING FURNACES.** 15 efficient, high production lines installed or under construction. EF has more installed capacity, and more experience in bright annealing stainless strip than any other furnace manufacturer.

✓ **VERTICAL OR HORIZONTAL DESIGNS**—whichever best suits your building conditions and specific production requirements.

✓ **FUEL FIRED OR ELECTRICALLY HEATED**—to use whichever heat is most economical in your plant. No restriction on width. Electric furnaces heated with our proven cast alloy resistor elements, assuring highly efficient heating. None better.

✓ **EF JET OR STATIC COOLING**—jet or combined jet and static cooling, shortens the cooling section.

✓ **HYDROGEN, DISSOCIATED AMMONIA OR VACUUM PROCESSING.** Continuous vacuum furnaces, one of EF's latest developments, save on overall installation and operating cost.

✓ **COMPLETE UNIT RESPONSIBILTY**—furnished completely erected with all controls, terminal equipment and product handling, ready for immediate on-line operation.

For the highest finish, and most durable corrosion resistant surface, contact the EF heat treating engineers. ***You'll find it pays!***

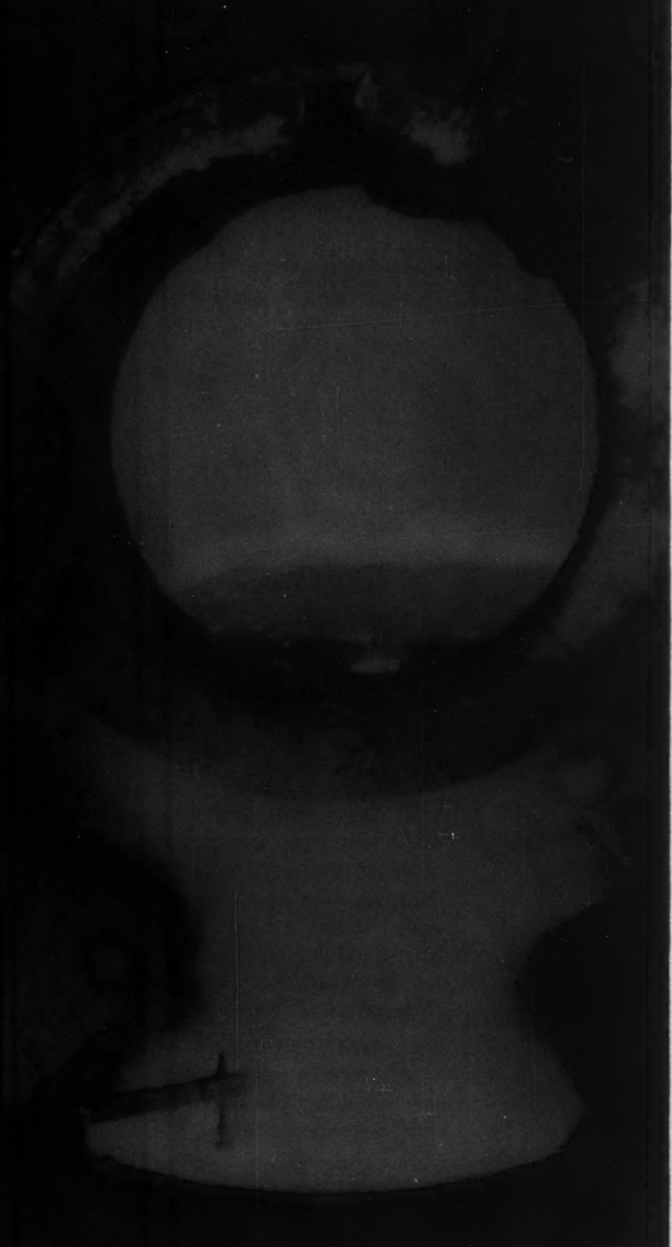
EF

THE ELECTRIC FURNACE CO.
Gas-fired, Oil-fired and Electric Furnaces for Heat Treating any Product, Using any Process, any Hourly Output.
400 West Wilson Street *Salem - Ohio*

SUBSIDIARIES — Turnkey Engineering Company, Inc., South Gate, California • Canefco Limited, Scarborough, Ontario
ENGINEERING & SALES REPRESENTATIVES — 2842 West Grand Blvd., Detroit 2, Michigan and 968 Coleman Rd., Cheshire, Conn.

Now . . . More Than

7 MILLION TONS AHEAD



PECOR

Basic Oxygen Converters

As the world's only maker of oxygen converters larger than 100 tons . . . Pennsylvania Engineering has furnished vessels and auxiliaries with which America's entire output of oxygen-converted steel has been produced — more than 7 million tons. • The record demonstrates: RELIABILITY — equipment notable for staying on-the-line and making steel. QUALITY in design and manufacture, reflecting unique experience and precision engineering. SERVICE — immediate response to field requirements.

May we consult with you in the planning stage of any project involving oxygen converters, ladles, hot metal mixers, cars and related equipment for processing molten iron or steel?

Pennsylvania Engineering CORPORATION NEW CASTLE, PA.

Sales Representatives: Wooldridge Company, Burlingame, Calif.
Fred Middleton Co., Inc., Birmingham, Ala.

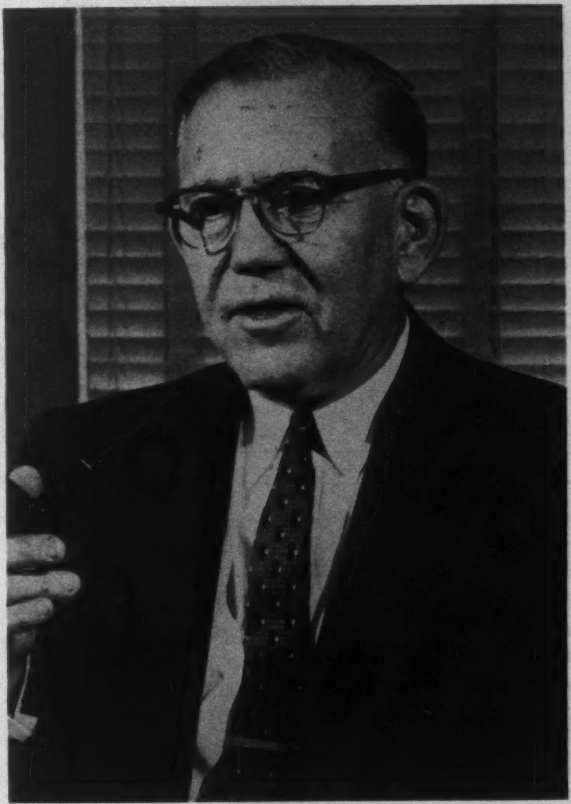
BUILDER OF AMERICA'S FIRST 15 OXYGEN CONVERTERS

S. C. Read

He's a Busy, Top Steelman

S. C. Read is a top man in the Jones & Laughlin Steel Corp. management team.

His hard work has earned him a host of friends and led to the presidency of the Assn. of Iron and Steel Engineers.



S. C. READ: A top steelman.

▪ S. C. Read, director of construction and maintenance for Jones & Laughlin Steel Corp., and president of the Association of Iron and Steel Engineers, began his industrial career with J&L in 1924. This was a time when little attention was paid to the clock and a continuous work stretch of 24 or even 72 hours was not uncommon when serious trouble developed in production equipment.

This philosophy of work was so ingrained in his early training that it still dominates his personal approach to the modern-day problems confronting him.

Times Change—While continuous 24-hour stretches on the site are now a thing of the past, Mr. Read still spends many hours solving everyday problems.

This tenacity and determination to see a job through to completion in a minimum of time has earned Mr. Read the respect of all those who have worked with and for him during his 36 years with J&L. His friendly greeting, innate sense of fairness, and loyalty down, as well as up, have made him many friends.

Long List—A count of his friends includes men from all departments of the company. Most of those in the mills are co-workers of earlier days. Many are men who have worked under his direction in the maintenance, production, and construction departments. Others are associates in the engineering, accounting, sales, purchasing, legal and other divisions of the company.

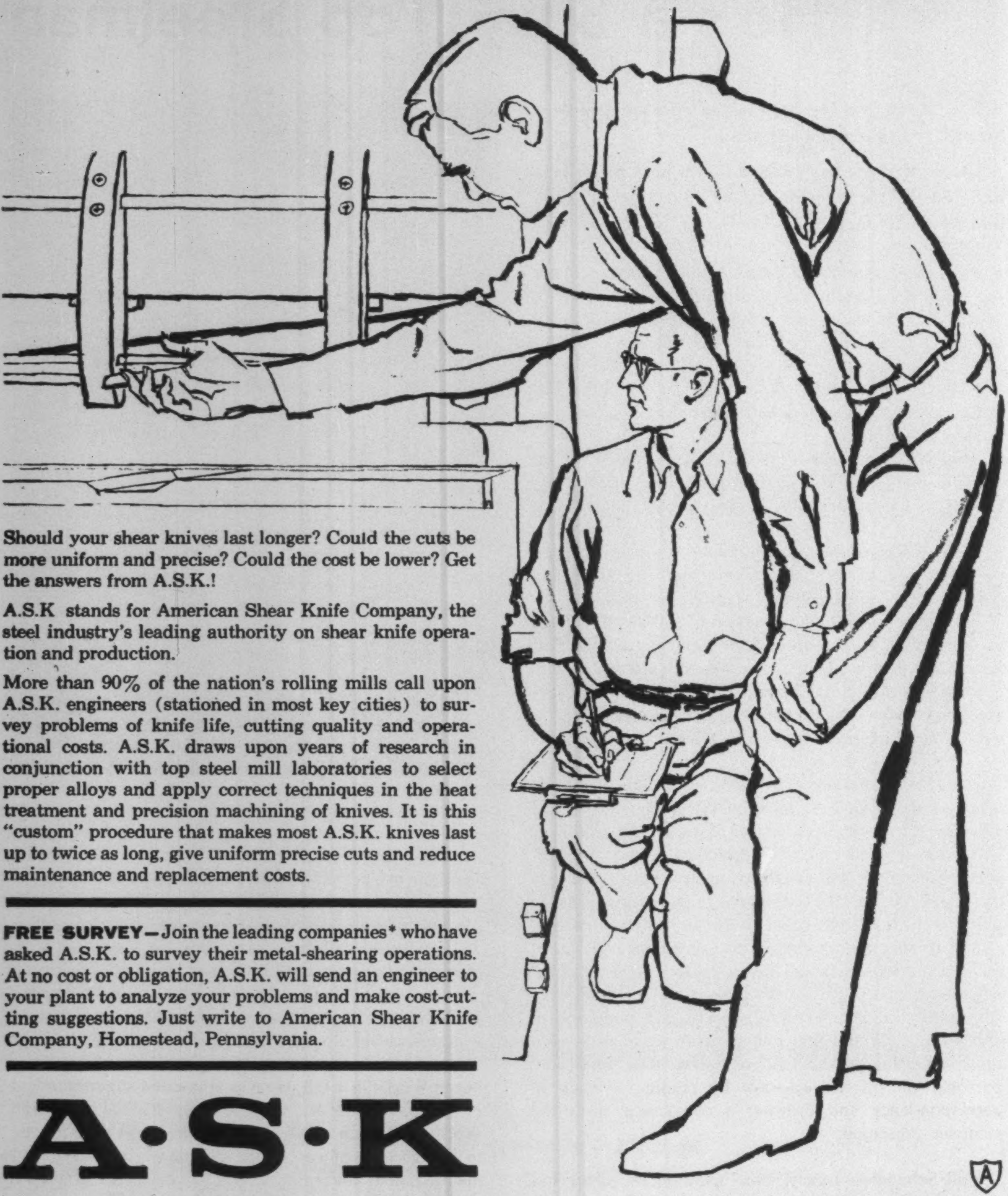
Mr. Read's basic approach to a problem is to ferret out the facts by personal investigation of the physical situation and discussion with all personnel involved. The information then is reviewed for reconciliation of conflicting data and segregation of the true story from those reflecting personal interest. But, it is done with personal get up and go—not by reading a stack of correspondence and drawing a conclusion from the evidence presented.

Full Schedule—Lately, time spent in the office has increased. But a good amount is still utilized in visiting the various plants for a first hand knowledge of what is going on. With seemingly unlimited energy, he supplements his office work with frequent visits to the golf course. In between, his hobbies include work in the yard at his home in Mt. Lebanon and playing bridge. And a portion of his spare time is taken up with activities of the Association of Iron and Steel Engineers.

Following a few years' service with the Pennsylvania Railroad, he started to work for J&L as assistant superintendent, Power Dept. at Pittsburgh Works. He became master mechanic, Rolling Mills at J&L's Pittsburgh Works in 1938. He was appointed superintendent of Blooming Dept. and Rolling Mills, Pittsburgh Works, in March, 1946. In November, 1947, he moved to the general offices of the company as manager of maintenance, advancing later to manager of construction and maintenance and finally to his present position in September, 1950.

Can you get more wear from your shear knives?

A·S·K for the answer!



Should your shear knives last longer? Could the cuts be more uniform and precise? Could the cost be lower? Get the answers from A.S.K.!

A.S.K stands for American Shear Knife Company, the steel industry's leading authority on shear knife operation and production.

More than 90% of the nation's rolling mills call upon A.S.K. engineers (stationed in most key cities) to survey problems of knife life, cutting quality and operational costs. A.S.K. draws upon years of research in conjunction with top steel mill laboratories to select proper alloys and apply correct techniques in the heat treatment and precision machining of knives. It is this "custom" procedure that makes most A.S.K. knives last up to twice as long, give uniform precise cuts and reduce maintenance and replacement costs.

FREE SURVEY—Join the leading companies* who have asked A.S.K. to survey their metal-shearing operations. At no cost or obligation, A.S.K. will send an engineer to your plant to analyze your problems and make cost-cutting suggestions. Just write to American Shear Knife Company, Homestead, Pennsylvania.

A·S·K

AMERICAN SHEAR KNIFE

**names supplied on request*

H. C. Lackey, elected president, director and chief executive officer, Erie Forge & Steel Corp.

C. R. Pearce, Jr., appointed commercial manager, forged products, U. S. Steel Corp.

T. Singelis, named vice president, marketing services, Clearing Div., U. S. Industries, Inc.

National Electric Welding Machines Co.—**Simon Fisher,** elected president.

Clearing, Div. of U. S. Industries, Inc. — **H. M. Crossen,** appointed vice president, manufacturing.

Electric Steel Foundry Co. — **C. E. Haney,** named vice president.

Olin Mathieson Chemical Corp. —**A. T. Zodda,** named corporate vice president; **F. J. Stock,** appointed a corporate vice president.

Engineering and Construction Div., Koppers Co., Inc. — **J. A. Hartzell,** appointed a vice president.

Burroughs Corp.—**P. S. Mirabito,** promoted to vice president, defense contracts organization.

Ross-Meehan Foundries—**P. H. Stuff,** elected president.

Jackson Industries Inc.—**William Bailey III,** named vice president, sales.

Michigan Abrasive Co.—**R. J. Foresman,** named a vice president.

Eaton Manufacturing Co. — **E. W. Clark,** named director, marketing research.

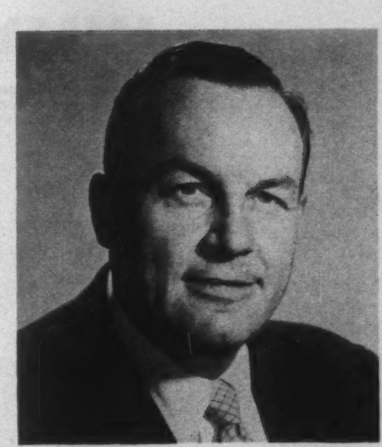
Selas Corp. of America — **J. S. Blay,** named metallurgist.

The Rust Engineering Co.—**W. F. Edmonds,** named chief engineer, Birmingham, Ala.; **A. H. Krause,** appointed project manager; **S. C. Hart,** appointed manager, sales; **M. G. De Shazo, Jr.,** appointed project manager.

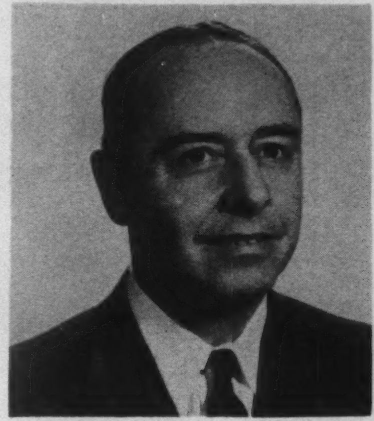
Conveyor Div., Columbus McKinnon Corp.—**E. S. Davidson,** appointed eastern regional sales manager.

Hill-Chase & Co., Inc.—**E. W. Crowthers,** appointed manager, technical services.

The W. L. Maxson Corp.—**F. J. Shannon, Sr.,** named manager, Washington, D. C., district.



W. A. Baltzell, elected vice president, Oakite Products, Inc.



J. J. Basch, elected second vice president, Oakite Products, Inc.

Cummins Engine Co., Inc.—**C. R. Boll,** appointed executive vice president, marketing; **R. W. Franck,** named vice president, sales.

The Seymour Manufacturing Co. —**W. G. Brown,** promoted to vice president and sales manager.

Pheoll Manufacturing Co., Inc. —**S. C. Adamek,** appointed vice president, operations.

J. Bishop & Co. Platinum Works, Mechanical Division—**W. C. Stewart,** named manager.

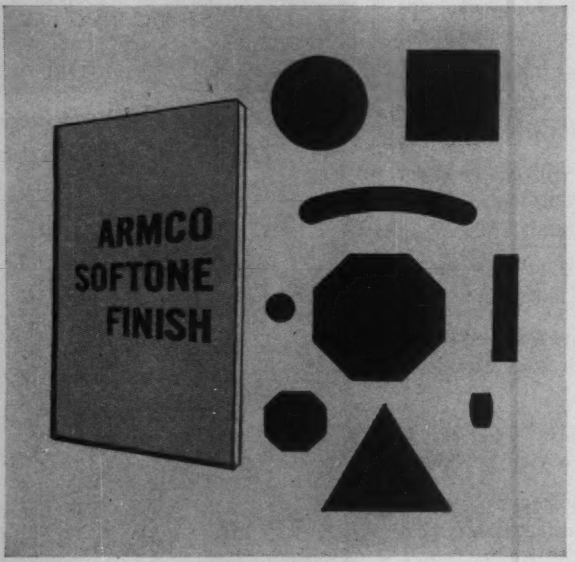
National Carbon Co. — **J. A.**

(Continued on P. 140)

ARMCO STEELS / for better products • lower costs

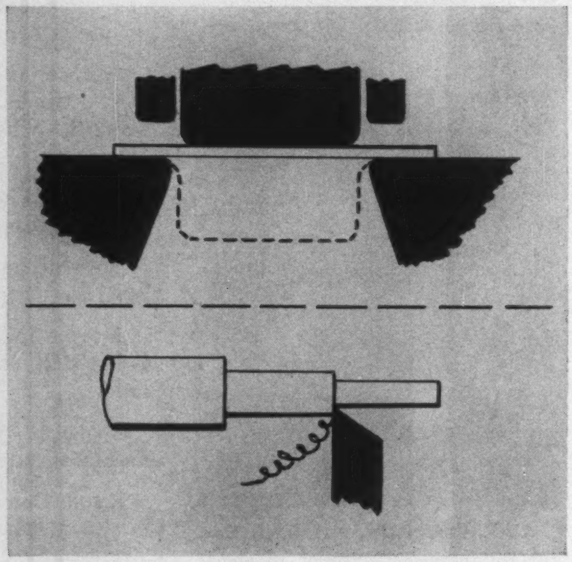
WHY ARMCO STAINLESS MEET DESIGN NEEDS AT

Armco Stainless Steels enable you to design to your specific needs at least cost because they are available not only in all the standard types but in many special grades as well. You can select an Armco Stainless Steel with the most economical durability; with fabricating properties suited to your design and shop equipment; with special mill finishes, machinability, and heat treatment that cut production costs.



Maximum Economy

Where corrosion problems are not severe, Armco Stainless such as Types 405, 410, 420 and 430 provide necessary durability at minimum cost. Special Armco surface finishes on sheet and strip can eliminate some finishing operations. A wide range of standard and special bar and wire shapes also makes it possible to cut costs by reducing machining operations.



Fabrication Simplified

Armco produces many variations of the standard stainless types to facilitate fabrication and cut production costs. They include 11 free-machining grades, at least one for each basic type of stainless. In addition, Armco Type 304, 304 ELC and 316 ELC simplify production of welded stainless equipment. Grades such as Armco Type 305 plus special Armco processing facilitate drawing and forming.

In designing and manufacturing parts of your products that must be durable, beautiful or strong, you can profit with the specific advantages of Armco Stainless Steels. Write us, describing your requirements, or fill out and mail the coupon. Armco Steel Corporation, 1740 Curtis Street, Middletown, Ohio.

ARMCO STEEL CORPORATION
1740 Curtis Street, Middletown, Ohio

Send me information on Armco Stainless Steels recommended for the following service: ____________________

____

NAME ____________________

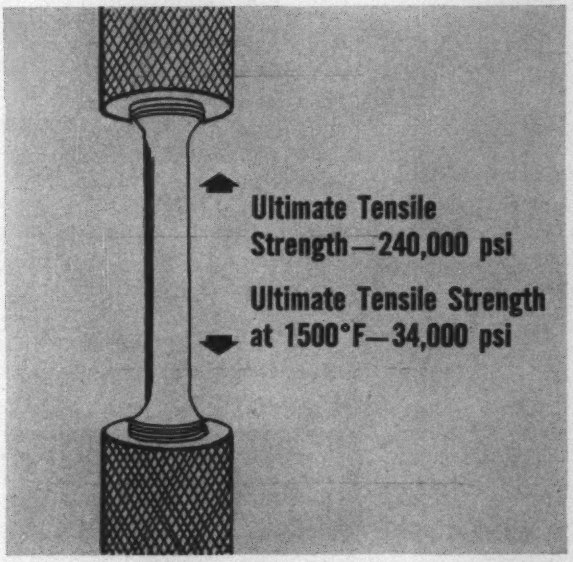
COMPANY ____________________

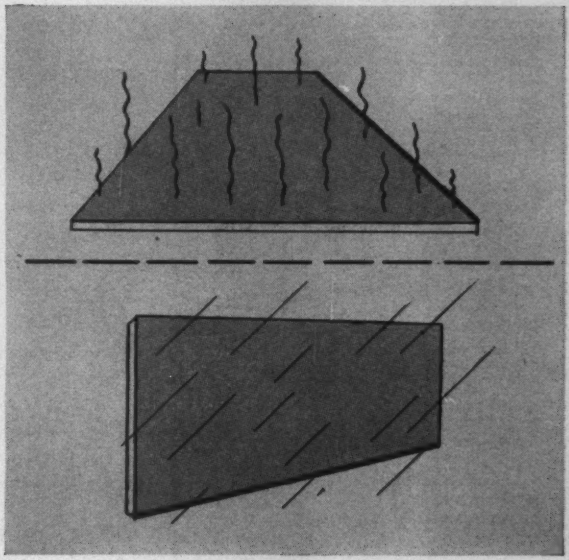
STREET ____________________

CITY ____________________ ZONE ________ STATE ____________

STEELS CAN HELP YOU LEAST COST

New steels are born at Armco


Ultimate Tensile Strength—240,000 psi
Ultimate Tensile Strength at 1500°F—34,000 psi



Unique Properties

Armco has developed many special stainless steels with unusual combinations of properties to meet specific demands for better materials. Typical examples are Armco 17-14 Cu Mo with high temperature strength and oxidation resistance; Armco 17-4 PH, 17-7 PH and PH 15-7 Mo with ultra-high strength and hardness plus good corrosion resistance and excellent fabricating properties; and Armco 17-10 P, a high strength grade that is non-magnetic.

Maximum Durability

Where service conditions are severe, Armco's standard or special stainless steels offer the possibility of maximum durability at lowest over-all cost. About 25 different grades of Armco Stainless Steels are available for applications that require superior resistance to oxidation or severely corrosive media in combination with high strength at room and elevated temperatures.

ARMCO STEEL

ARMCO

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

For
Quality
and
Economy
Use

MALLEABLE

For Service Contact...

CONNECTICUT
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Albion Malleable Iron Company, Muncie Division, Muncie
Link-Belt Company, Indianapolis 6
National Mall. & Steel Castings Co., Indianapolis 22

IOWA
Iowa Malleable Iron Co., Fairfield

MASSACHUSETTS
Belcher Malleable Iron Co., Easton

MICHIGAN
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

MISSISSIPPI
Mississippi Malleable Iron Co., Meridian

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
Maumee Malleable Castings Co., Toledo 5
National Mall. and Steel Castings Co., Cleveland 6

PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

WISCONSIN
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, Inc., West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

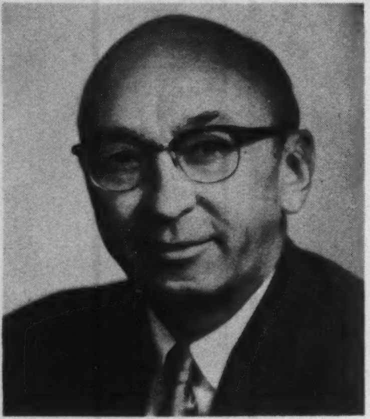
These companies are members
of the Malleable Castings Council

(Continued from P. 137)

Michel, appointed eastern division manager, electrode products.

Uniform Tubes, Inc. — **C. H. McClain,** appointed plant engineer.

J. I. Case Co.—**A. E. Lee,** appointed marketing coordinator.



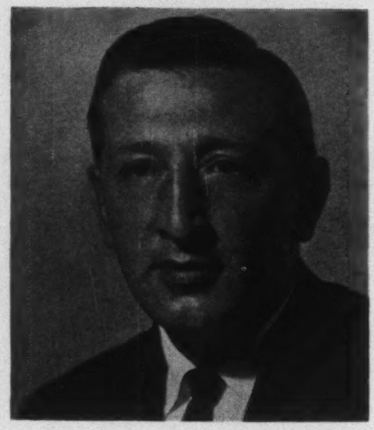
R. L. Hanes, appointed general manager, tubular sales, The Colorado Fuel & Iron Corp.

Keuffel & Esser Co. — **A. E. O'Keeffe,** appointed research associate.

The Babcock & Wilcox Co. — **E. L. Ogden,** appointed director, employee relations.

The Colorado Fuel & Iron Corp. —**A. G. Gutgsell,** appointed asst. district sales manager, Chicago district.

Kenneth Metcalfe, promoted to manager, technical service, Universal-Cyclops Steel Corp.



W. A. Klawitter, appointed supervisor, magnetic and expansion alloys research, The Carpenter Steel Co.

The Timken Roller Bearing Co., International Divisions — **W. H. Shealor,** appointed asst. director, sales.

Revere Copper & Brass Inc. — **Carl Prince,** appointed district manager, Miami district sales office.

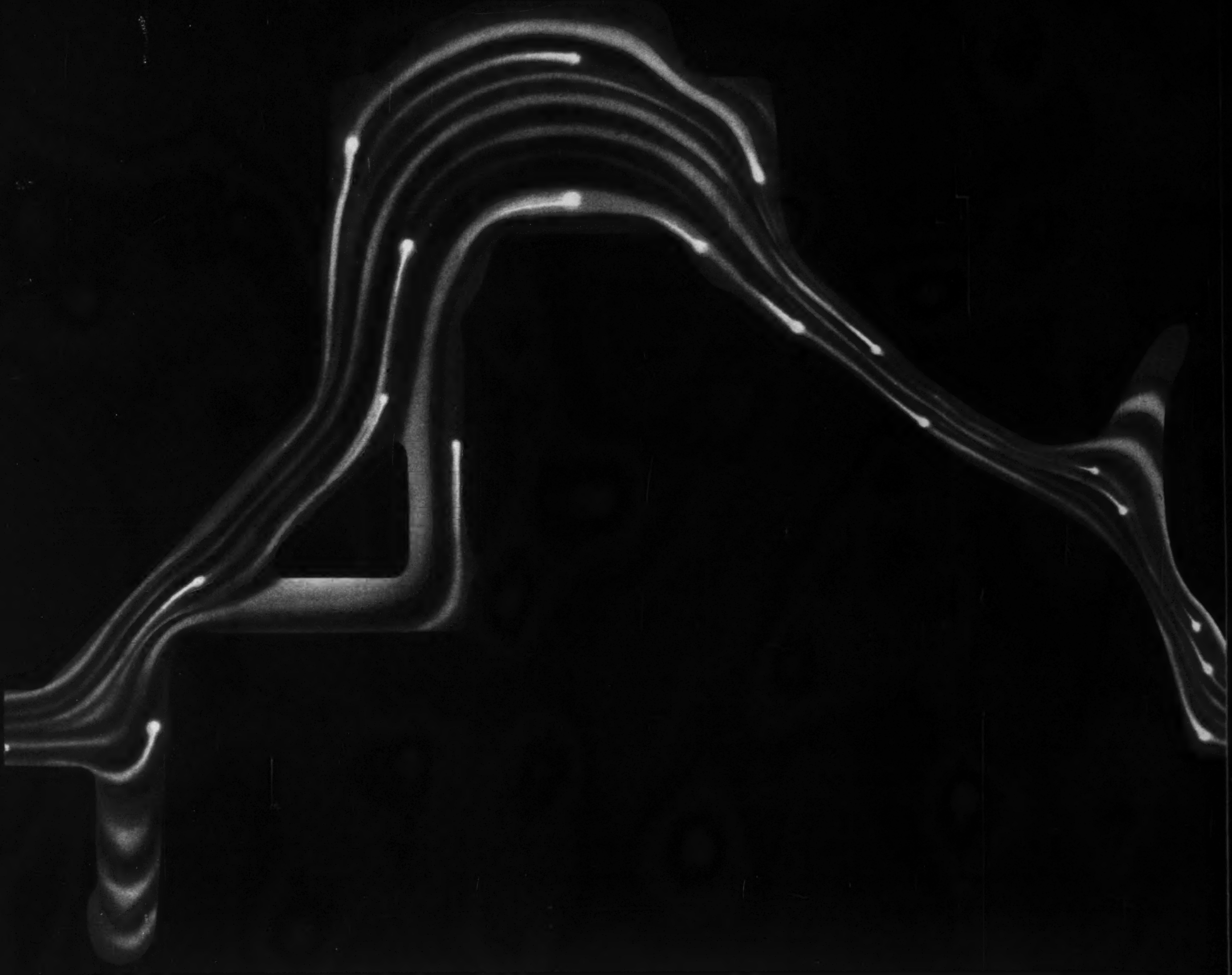
BMW Manufacturing Co., Inc. —**R. L. Guerin, Jr.,** appointed sales manager.

E. S. Frens, named manager, manufacturing engineering, Foundry Dept., General Electric Co.

Central Foundry Div., General Motors—**G. A. Hach,** promoted to sales manager, nonferrous metals.

Joy Manufacturing Co. — **J. W. Johnson,** becomes manager, Oil

(Continued on P. 144)



Liquid flow through a cross section of a Malleable differential carrier.

For Performance-Tested Dependability . . . Use Malleable

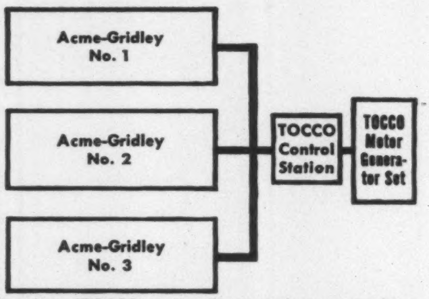
Molten metal flows evenly into all parts of the mold, then solidifies into pre-shaped parts with uniformly dependable properties throughout. Malleable iron castings will stand up under extremes of tension, impact, torsion, shear, fatigue, wear, heat, cold, and corrosion. They also offer maximum economy, are easy to work, and are versatile enough for parts ranging from a few ounces to hundreds of pounds.

The more manufacturers know about Malleable castings, the more they use Malleable to improve quality and increase profits. Get the full story on Malleable . . . Contact any of the progressive companies that display this symbol —

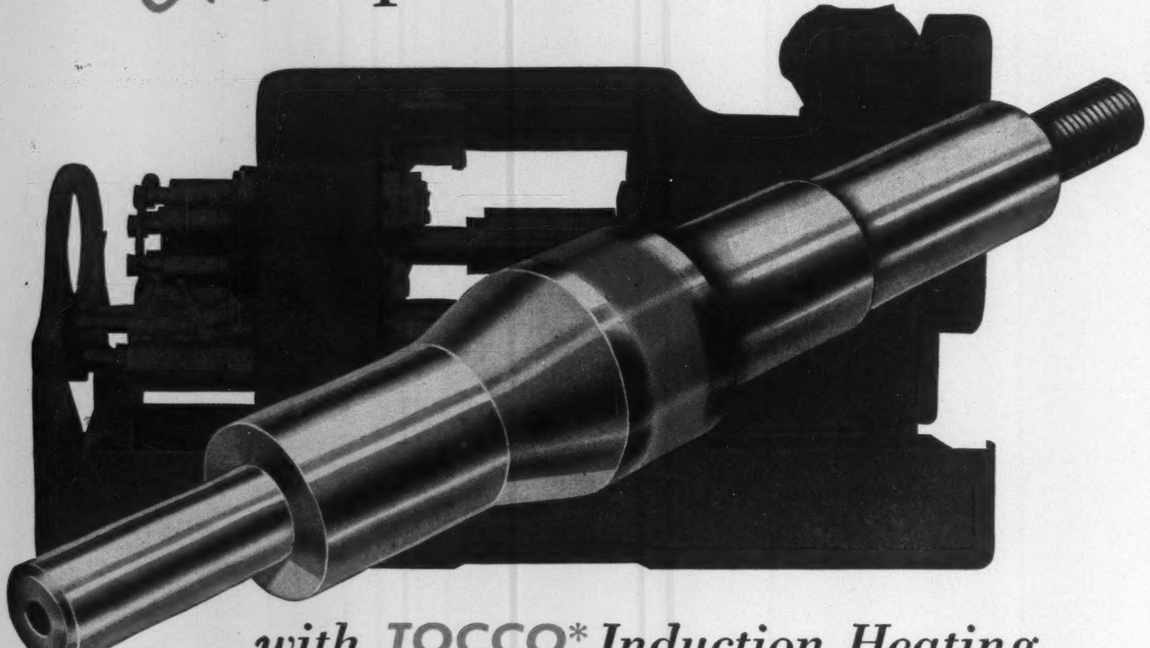
MEMBER
MALLEABLE
CASTINGS COUNCIL

For details on Malleable's uniformity and reliability contact any company listed on the opposite page, or Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

Pump Shafts Machined and Hardened in ONE operation...



Plan view of TOCCO-equipped automatic screw machine installation for hardening collars on vane pump shafts.



with TOCCO* *Induction Heating*

TOCCO-equipped 8-spindle Acme-Gridley Screw Machines at a large automotive manufacturer's plant produce vane pump shafts for power steering units in one completely automatic operation! The hardening and metal-working operations are combined on the same machine. No additional handling—no hardening cost except power!

A TOCCO inductor, mounted at one station of each automatic, hardens collars on pump shafts after they have been completely machined at preceding stations on the same machine. Each installation consists of 3 automatic machines equipped with inductor coils powered by a 50 KW, 10,000 cycle TOCCO unit. Production from each installation is 360 shafts per hr.

Shafts are made of C 1144 and only the collar is hardened to prevent scoring the seal. TOCCO's rapid heating confines the hardened area to the surface of the collar leaving the rest of the shaft unaffected.

If your products or their components require heat treating, soldering, brazing or heating for forging, it will pay you to investigate TOCCO for better, faster production at lower unit costs.

TOCCO

JUST PUSH A BUTTON

*Trade Mark Reg. U. S. Pat. Off.

THE OHIO CRANKSHAFT COMPANY

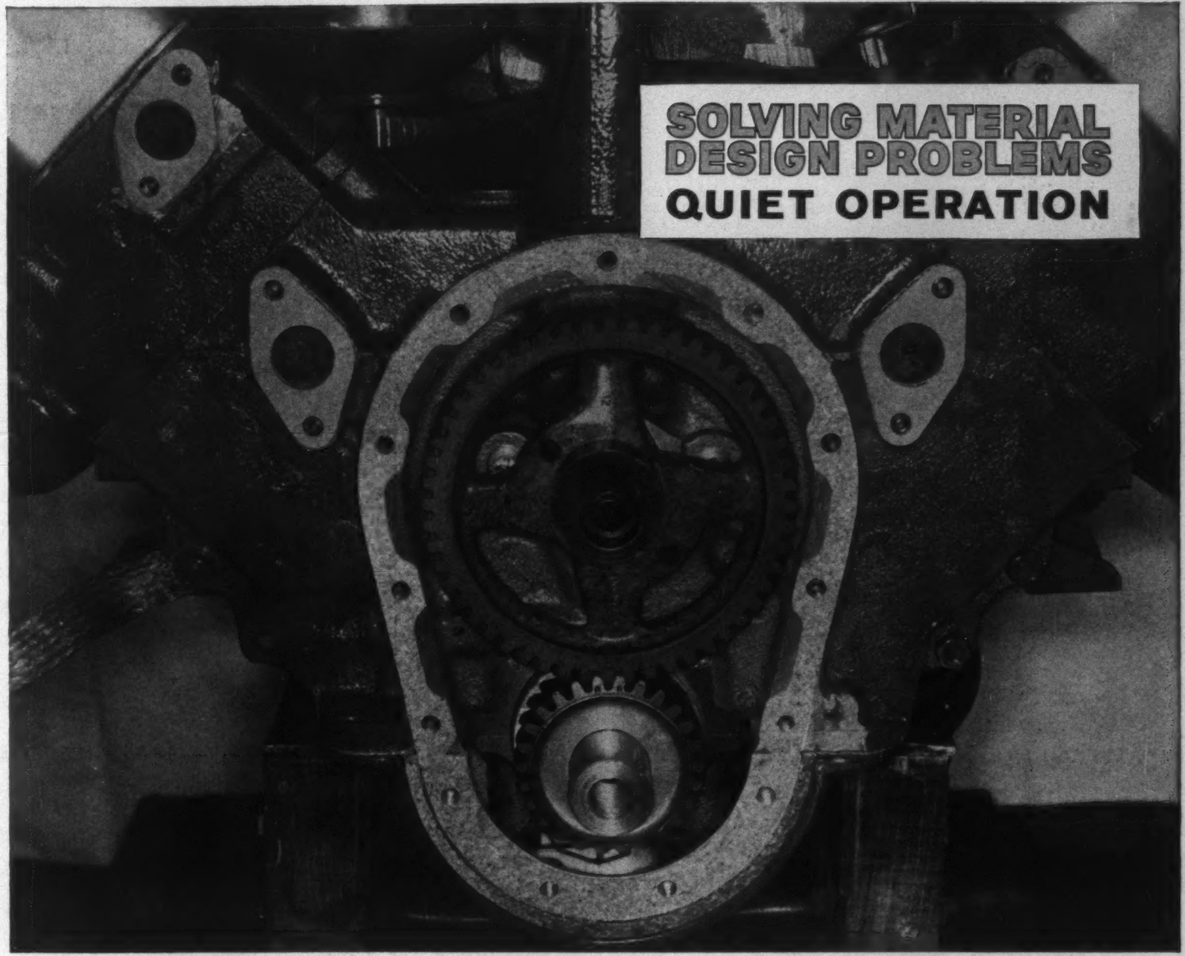
***Mail Coupon Today*— NEW FREE Bulletin**

The Ohio Crankshaft Co. • Dept. A-9, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating."

Name____
Position______________________________________
Company_____________________________________
Address______________________________________
City____________________Zone_____State________

SOLVING MATERIAL DESIGN PROBLEMS
QUIET OPERATION



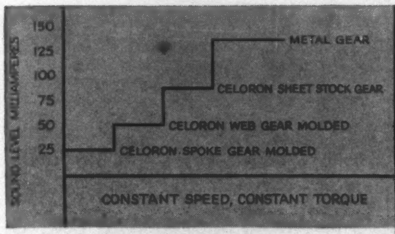
Timing gears made of CDF Celoron will not pick up and amplify sound due to Celoron's naturally low tone frequency. Tests show that Celoron gears reduce noise by up to 50% compared to all-metal gear sets!

Made of quality controlled, fabric reinforced phenolic resin, Celoron® high-impact gears are constantly replacing metal in critical areas ranging from earth-moving machinery to compact cars to movie projectors.

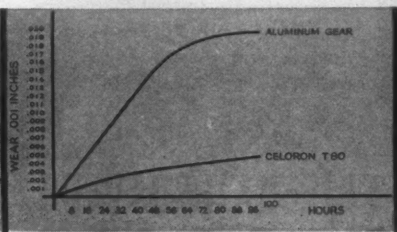
Celoron molded materials are only one family of products from industry's largest selection of non-metallic structural and electrical materials . . . including thermosetting laminates, vulcanized fibre, silicone rubber, and mica.

This wide choice gives you every assurance of meeting your exact quality and cost needs in plastic material. Refer to Sweets PD file or write to us for the latest Celoron catalog.

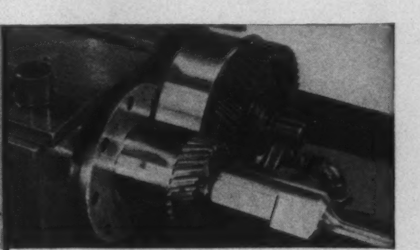
CONTINENTAL-DIAMOND FIBRE
A SUBSIDIARY OF THE Budd COMPANY • NEWARK 85, DEL.
In Canada, 46 Hollinger Road, Toronto 16, Ont.



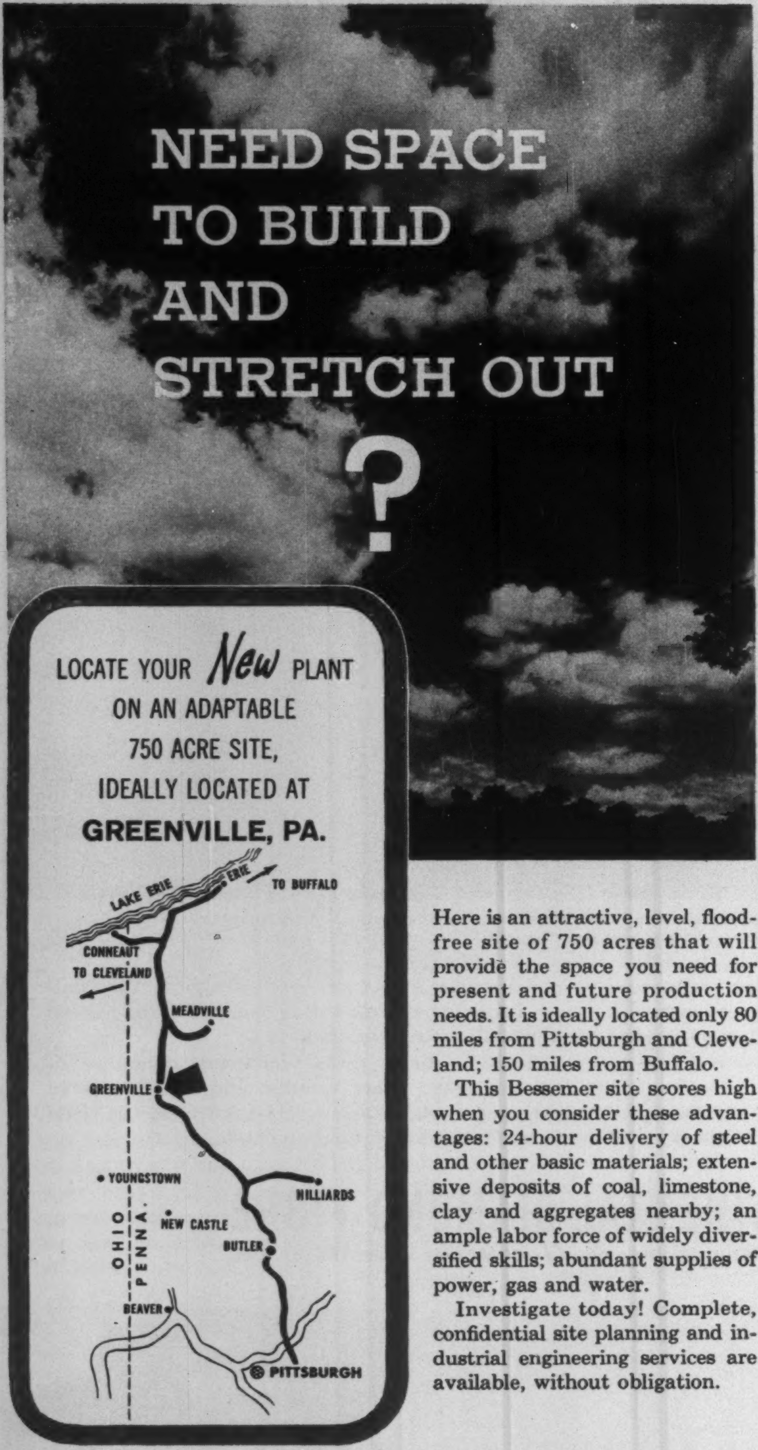
Low sound level of Celoron is shown by this graph which compares metal to the different types of Celoron gears.



Long wearing characteristics of Celoron gears are here contrasted to the shorter life spans of metal-made gears.



Quality control of Celoron gears is assured by special testing machines such as this in CDF laboratories.


NEED SPACE
TO BUILD
AND
STRETCH OUT
?
LOCATE YOUR *New* PLANT
ON AN ADAPTABLE
750 ACRE SITE,
IDEALLY LOCATED AT
GREENVILLE, PA.
LAKE ERIE
ERIE
TO BUFFALO
CONNEAUT
TO CLEVELAND
MEADVILLE
GREENVILLE
YOUNGSTOWN
HILLIARDS
NEW CASTLE
OHIO
PENNA.
BUTLER
BEAVER
PITTSBURGH

Here is an attractive, level, flood-free site of 750 acres that will provide the space you need for present and future production needs. It is ideally located only 80 miles from Pittsburgh and Cleveland; 150 miles from Buffalo.

This Bessemer site scores high when you consider these advantages: 24-hour delivery of steel and other basic materials; extensive deposits of coal, limestone, clay and aggregates nearby; an ample labor force of widely diversified skills; abundant supplies of power, gas and water.

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(Continued from P. 140)

Field Compressor Sales Dept., Dallas, Texas.

F. S. Romanse, named division purchasing agent, Boiler Div., The Babcock & Wilcox Co.

Reynolds Metals Co. — **E. G. Drewry,** named manager, Phoenix Extrusion Plant.

Texas Gas Transmission Corp.—**M. G. Martin,** appointed manager, gas reserves.

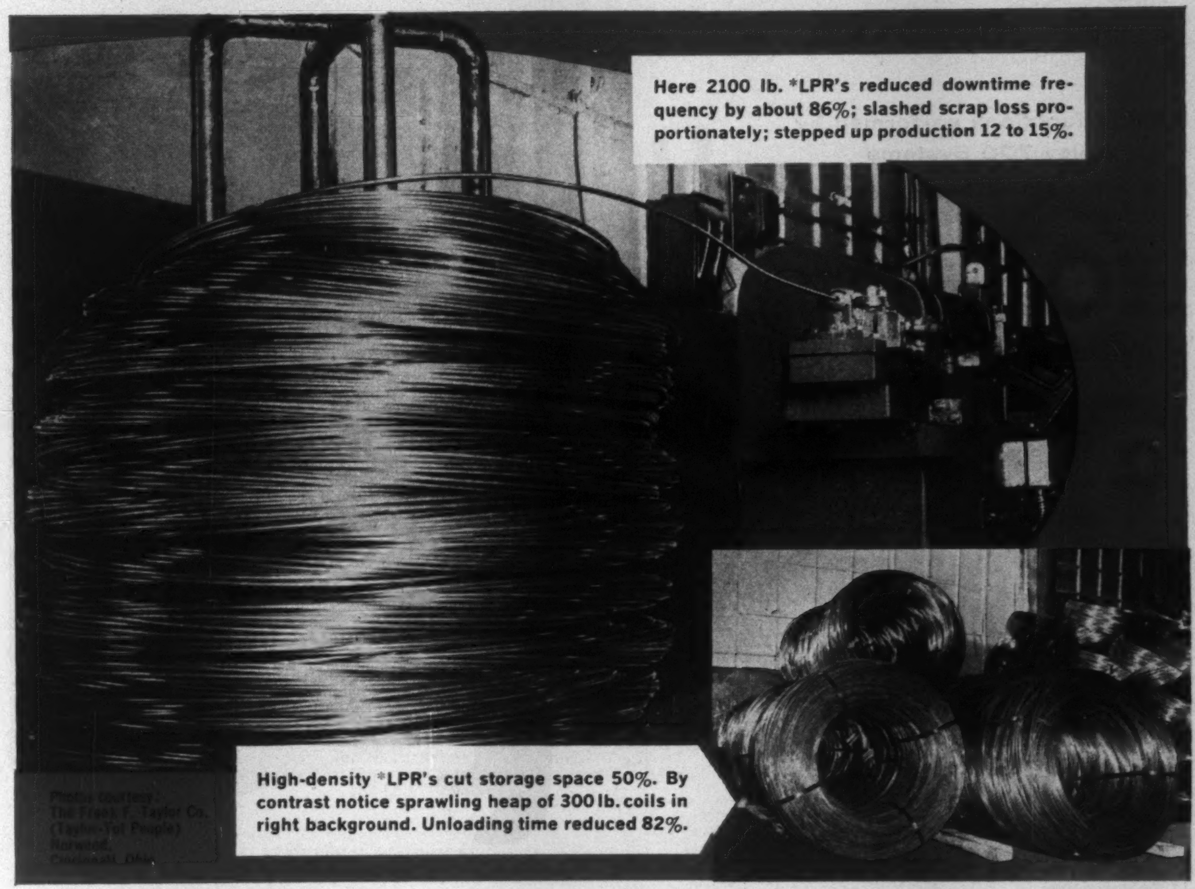
Harvey Aluminum—**Don Fullerton,** appointed district sales manager, Portland, Ore.

M. J. Helmich, appointed chief engineer, Development Div., The Cooper-Bessemer Corp.

The Goss Co., Div. of Miehle-Goss-Dexter, Inc.—**S. J. Marinello,** named general works manager.

American Steel & Wire Div., U. S. Steel Corp.—**G. A. Pyle,** named

(Continued on P. 148)



Here 2100 lb. *LPR's reduced downtime frequency by about 86%; slashed scrap loss proportionately; stepped up production 12 to 15%.

High-density *LPR's cut storage space 50%. By contrast notice sprawling heap of 300 lb. coils in right background. Unloading time reduced 82%.

Photos courtesy:
The Frank F. Taylor Co.
(Taylor-Tot People)
Norwood,
Cincinnati, Ohio

Brite wire fabricators report these savings from DSC-PORTSMOUTH Long Production Run *LPR COILS

HIGH-DENSITY *LPR's weighing from about 1200 to 4200 lbs. cost no more than comparable gauge and grade brite wire in traditional 150 to 400 lb. bundles. *But see what they save you in fabricating.*

***LPR's FEED UP TO 28 TIMES MORE WIRE PER SET-UP** —in single-length run—eliminating up to about 95% of production stoppages due to coil changes and set-up adjustments . . . They shrink your downtime, minimize your coil-remnant scrap.

THEY INCREASE YOUR NET OUTPUT per man-hour or per shift; cut your unit fabricating costs; save material. They widen your manufacturing margin, strengthen your competitive position.

WHAT'S MORE . . . high-density packaging (greater weight per cubic foot) conserves your storage space; makes your coil stock more accessible; sharpens your inventory control; cuts your handling time, expense and effort in shifting bundles from unloading platform to stock room—to production floor—to machine. Rids you of bothersome returnable carriers and small coil racks.

THE PROOF? We'll gladly present the details . . . or you can convince yourself by a job-test under your own operating conditions. *We'll help you set the stage* . . . For immediate action call your nearest DSC Customer "Rep" or write: DETROIT STEEL CORPORATION, BOX 7508, DETROIT 9, MICHIGAN.

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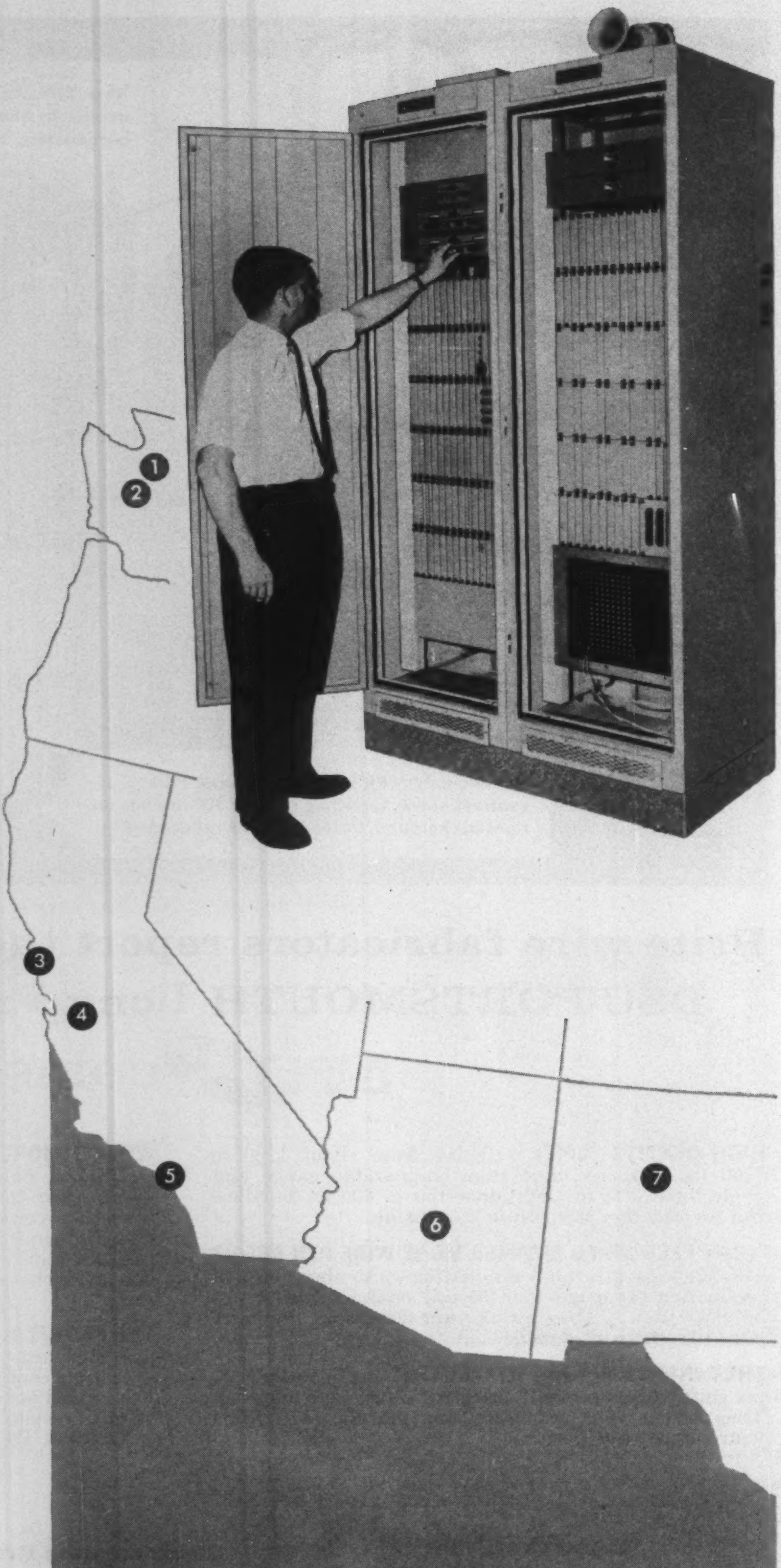
KEY to functions performed by Bailey 700 Systems

A — Analog A/D — Analog and Digital
D — Digital s — sense and measure
d — display (indicate, record and/or log)
m — monitor (scan and alarm)
p — produce stored information for future use (tape, cards) c—compute r—control

● Installed ● On order

LOCATION	TYPE	FUNCTIONS
1. Chelan Co., Wash.	D	sdm
2. Chelan Co., Wash.	D	sd
3. San Francisco	A	sdc
4. Salinas, California	A	sdc
5. Los Angeles	A	sdc
6. Glendale, Ariz.	A	sdc
7. Alameda, N. M.	A	sdc
8. Amarillo, Texas	A/D	sdmc
9. Smithers Lake, Tex.	A	sdr
10. Orange Co., Tex.	A/D	sdmcr
11. Bronte, Tex.	D	sdm
12. Sioux Falls, S. D.	A	sdr
13. Oklahoma City	A	sdc
14. Harrah, Okla.	A	sdc
15. Muskogee, Okla.	A	sdc
16. Lafayette, La.	A	sdc
17. Jackson, Miss.	A	sdc
18. Cleveland, Miss.	A	sdc
19. Memphis, Tenn.	D	sdm
20. Paducah, Ky.	D	sdc
21. Sullivan, Ind.	A	sdc
22. Graham, W. Va.	A	sdc
23. Ashtabula, Ohio	A	sdc
24. Monroe, Mich.	A	sdcr
25. Rochester, N. Y.	A	sdc
26. Ludlowville, N. Y.	D	sdmp
27. Buchanan, N. Y.	A	sdr
28. Fairless Hills, Pa.	D	dm
29. Wilmington, Del.	D	dm
30. Washington, D. C.	D	dp
31. Hamilton Twp., N. J.	A	sdr
32. N. S. Savannah	A	sdr



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G153-2

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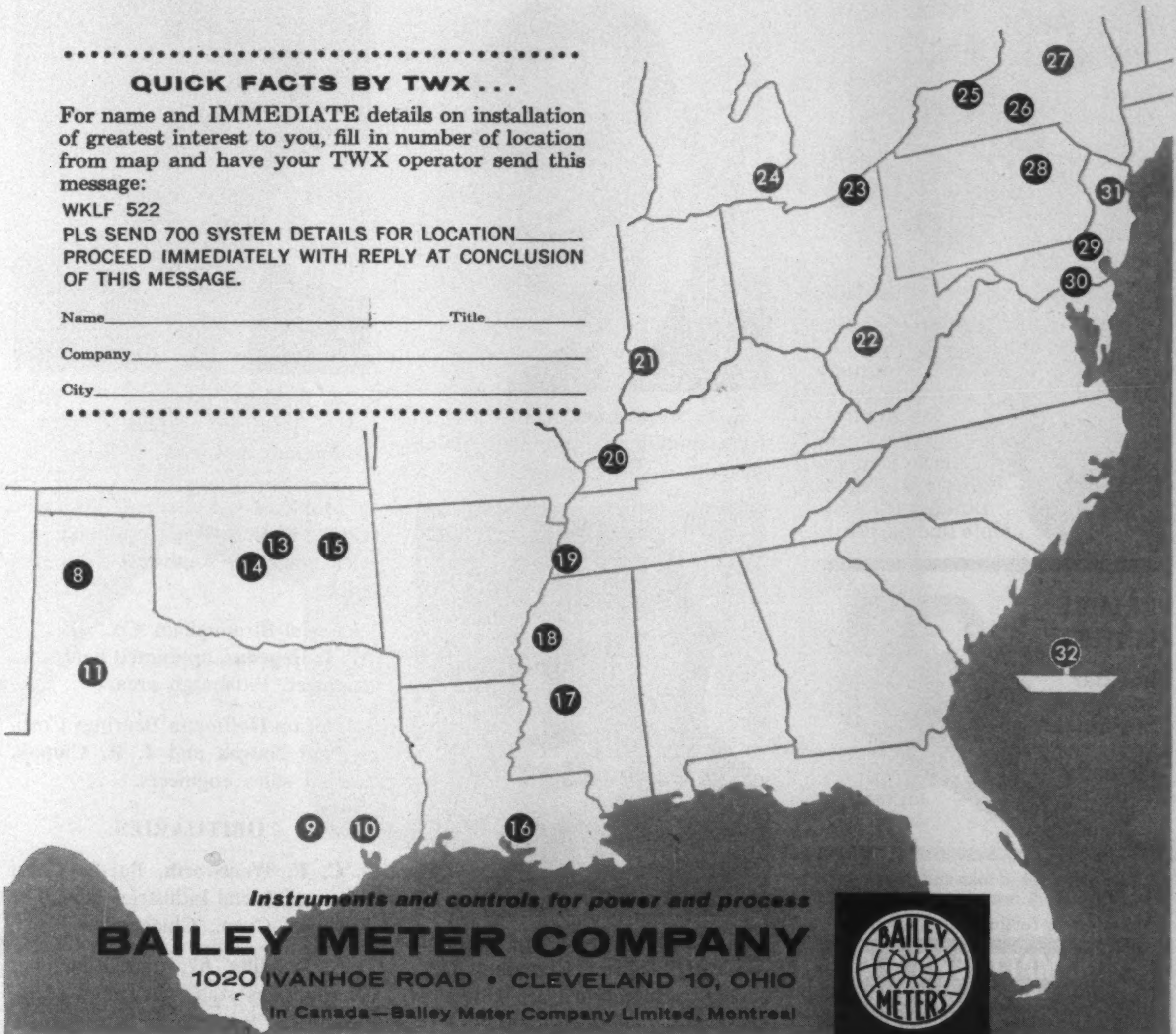
PLS SEND 700 SYSTEM DETAILS FOR LOCATION______.
PROCEED IMMEDIATELY WITH REPLY AT CONCLUSION OF THIS MESSAGE.

Name________________________________Title____________

Company____

City____



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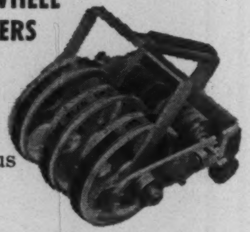

Hand rollers or in-line units for continuous overall sheet marking

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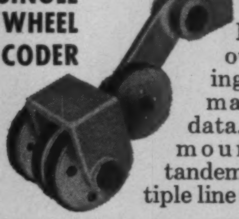

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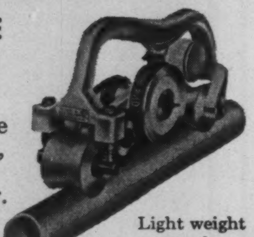

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(Continued from P. 144)

asst. manager, Manufacturers Product Sales Dept., and **C. W. Meyers,** appointed manager, stainless steel product sales.

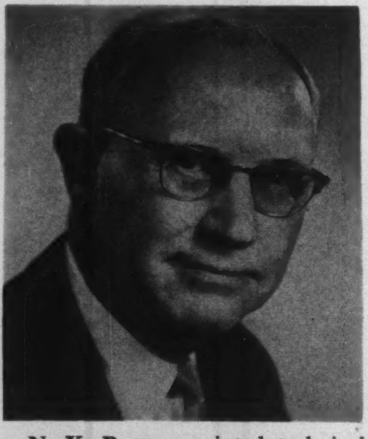
Cleveland Cliffs Iron Co. — **R. W. Taber,** appointed assistant to the president.

General Refractories Co.—**G. R. Rittenhouse,** appointed treasurer and **J. E. Hartshorn,** appointed secretary.

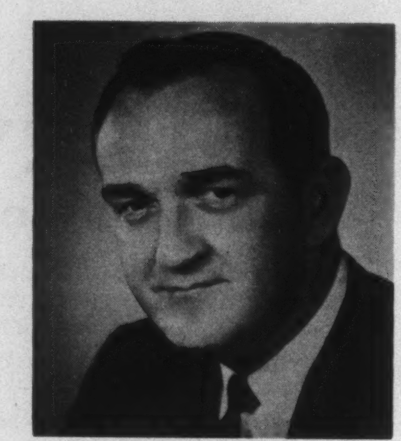
Firth Sterling Inc., Carbide Div. —**D. G. Crownover,** appointed Detroit district manager.

Bohn Aluminum & Brass Corp. —**G. H. Dettman,** appointed sales engineer, Chicago district.

E. L. Van Sickel, named asst. to the executive vice president, Penn Machine Co., Pittsburgh.



N. K. Barr, appointed technical manager, Electrical Conductor Div., Kaiser Aluminum & Chemical Sales, Inc.



J. B. Roche, named chief engineer, overhead conductor products, Kaiser Aluminum & Chemical Sales, Inc.

R. S. Keith, becomes chief engineer, insulated products, Kaiser Aluminum & Chemical Sales, Inc.

Morse Twist Drill & Machine Co.—**M. E. Miles,** appointed service engineer, southwest sales district.

Farrel-Birmingham Co., Inc. — **W. J. Hegedus,** appointed field sales engineer, Pittsburgh area.

Norma-Hoffmann Bearings Corp. —**Paul Nowak** and **J. R. Ciupak,** named sales engineers.

OBITUARIES

C. F. Wentworth, Pacific Coast manager, Metal Industries Div., The Diversey Corp., Chicago.

S. J. Mills, 67, retired member of the sales staff, Cleveland plant, Joseph T. Ryerson & Son, Inc.

Gears, roll necks and bearings "shielded" by Ironsides tailored-to-the-mill lubricants are successfully carrying the loads of higher speed production.

Ironsides

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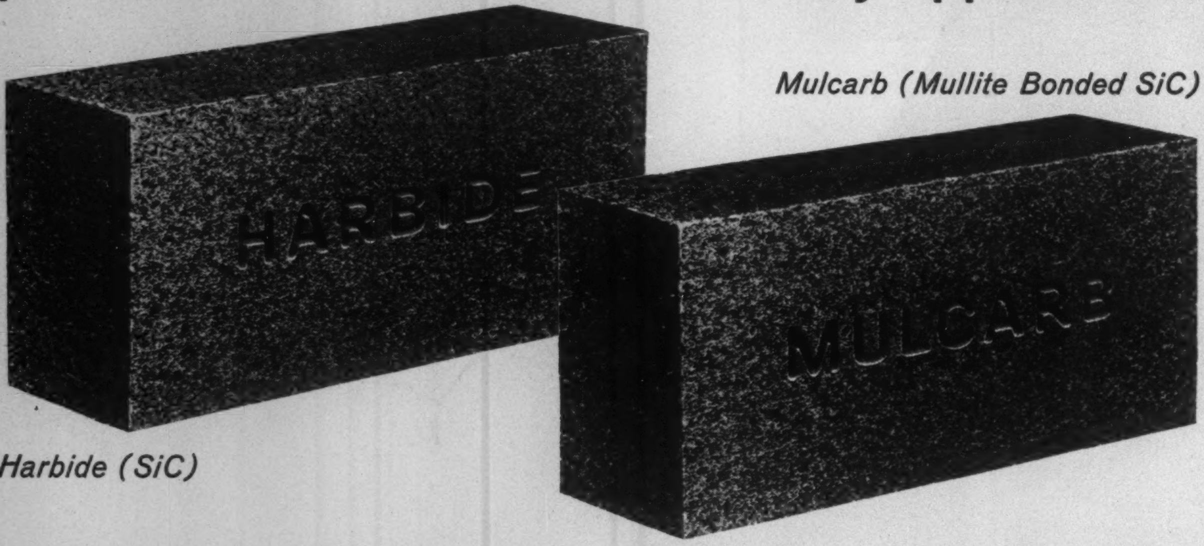
HARBISON-WALKER
SILICON CARBIDE REFRACTORIES
prove their unusual worth in many applications



Mulcarb (Mullite Bonded SiC)

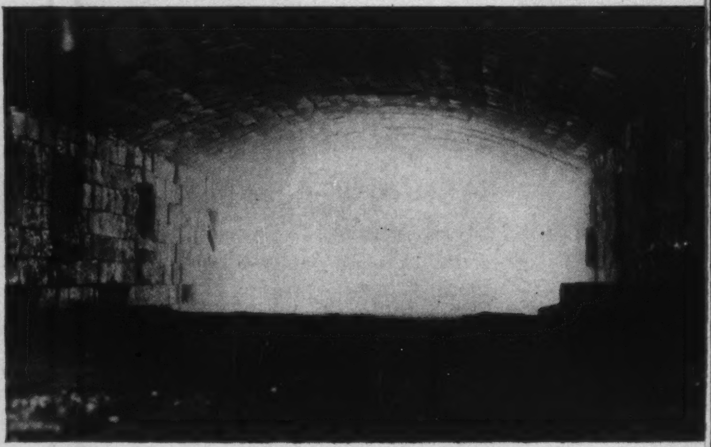
Harbide (SiC)

By taking advantage of particular properties of these brands and their specialized modifications for various specific uses, excellent service is regularly secured. These benefits are attributable to the singular combinations of physical and chemical properties of these silicon carbide refractories, unmatched by the many other types and classes of commercial refractories.

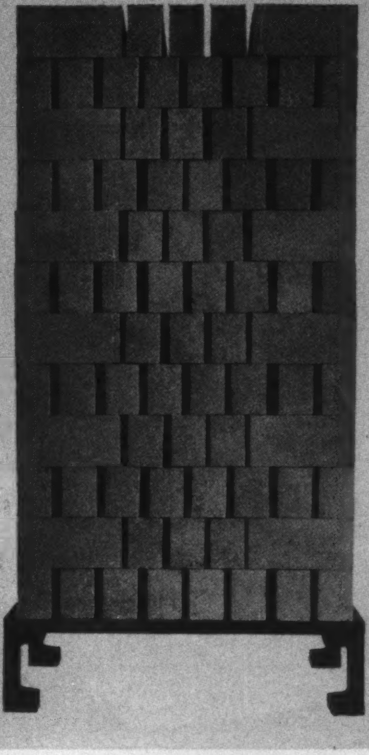
Physical properties possessed to the maximum degree by Harbison-Walker silicon carbide refractories make them best suited for many uses. Briefly these properties are—High Thermal Conductivity—Great Resistance to Mechanical Abrasion over a wide range of temperatures—Resistance to Various Fluxes—High Temperature Strength—Low Thermal Expansion and Low Spalling Tendency. Their increased resistance to oxidation and their volume stability under severe temperature conditions contribute further to the noteworthy achievement in the development of these Harbison-Walker brands.

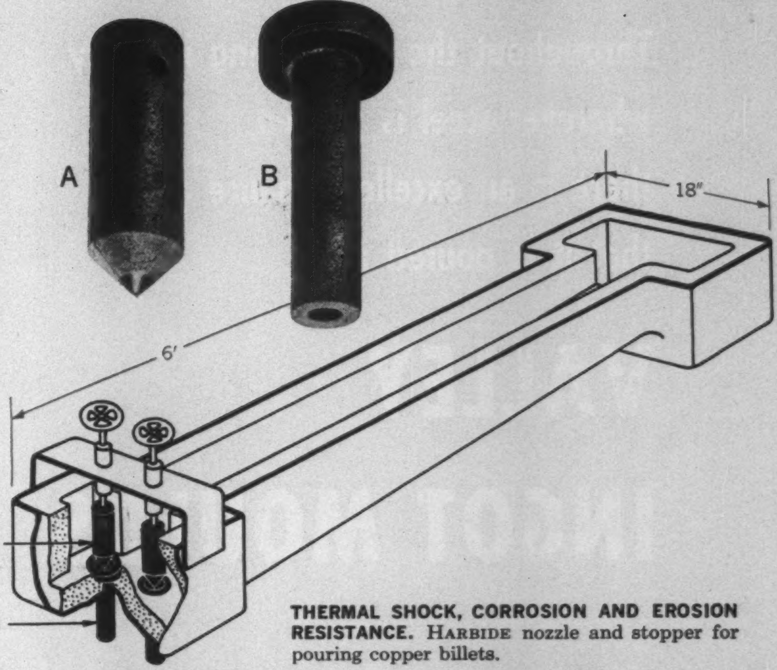
Illustrated in the following are typical uses and properties of primary importance in the accomplishment of superior results in refractory practice:

HIGH THERMAL CONDUCTIVITY. Large thin HARBIDE muffle tile for zinc refining furnace.



ABRASION RESISTANCE. HARBIDE blocks after long service in floor of heating furnace.





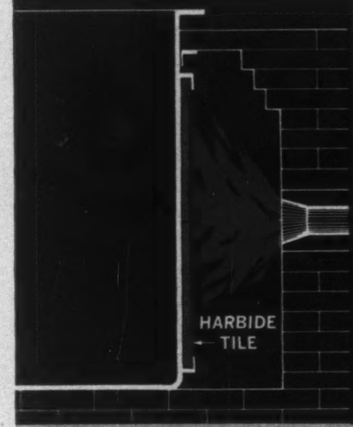
THERMAL SHOCK, CORROSION AND EROSION RESISTANCE. Harbide nozzle and stopper for pouring copper billets.

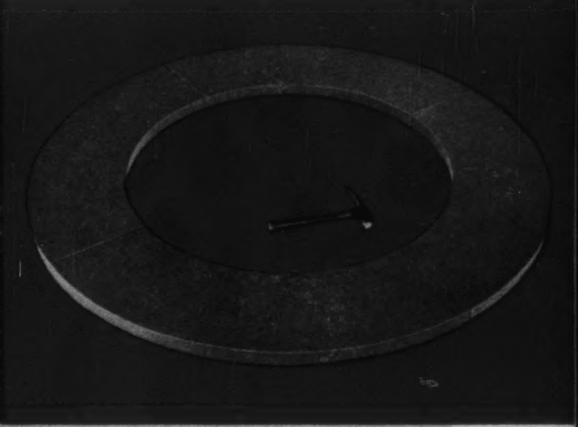
HIGH TEMPERATURE STRENGTH. Harbide setter tile and supports, with heavy brick load, fired at Cone 18 makes many trips through tunnel kiln.

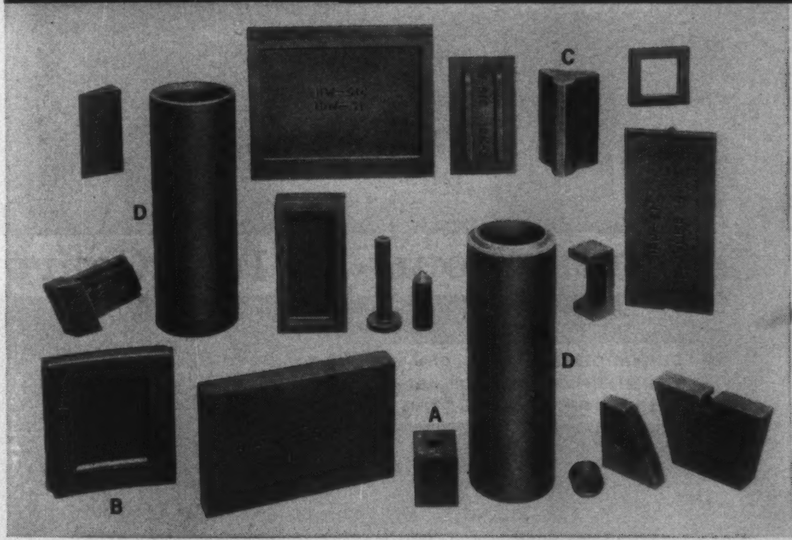
CORROSION RESISTANCE. Protection against burning, with advantage of high heat transfer.

RESISTANCE TO DUST ATTRITION. (far right) Plate-type Harbide orifice for blast furnace raw gas scrubber.

VERSATILITY. Group of H-W silicon carbide shapes shown below, right, includes (A) tapping block (B) muffle tile (C) trefoil skid rail and (D) large tubes.







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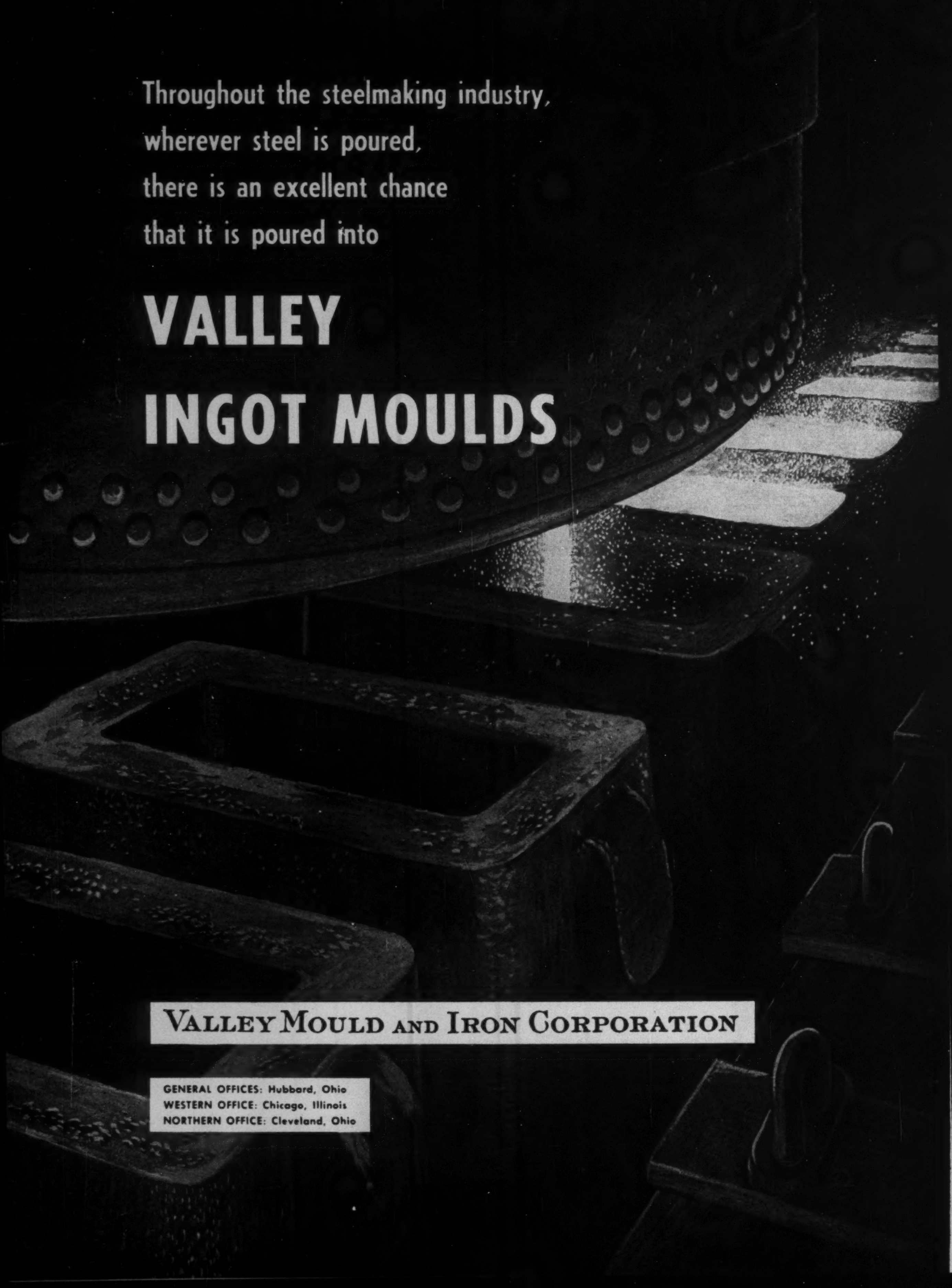

Throughout the steelmaking industry,
wherever steel is poured,
there is an excellent chance
that it is poured into

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Modern Steelmaking Processes Boost Quality and Output

Some people feel American steelmakers aren't on their toes when it comes to blazing new development trails.

Critics cite the venturesome attitude of foreign mills.

Often, this foreign action is forced. With limited funds, some countries can't afford to use mass-volume methods.

By **G. J. McManus**
Pittsburgh Regional Editor

▪ Has the steel industry rid itself of a mental block? What are the current reactions to new ideas and new processes?

There seems to be no question that the industry is reacting with new speed and boldness in some areas.

The new mood shows up in the vast programs of ore beneficiation; in the rapid swing to openhearth oxygen; and in new methods of blast furnace operation.

Trail Blazers — However, there are those who feel this country is still on the sluggish side when it comes to breaking trails. In completely new processes, like direct reduction and continuous casting, foreign countries are still much more willing to lead the way.

At present there are 13 continuous casting plants in commercial operation. Only one of these is in the United States. Seven more installations are coming up. All will be outside the U. S. A.

A similar pattern is seen for direct reduction by W. P. Bakarian, who heads up the RN project of Republic Steel Corp. and National Lead Co. In 150 laboratory tests and seven pilot tests run for RN prospects this year, strong foreign interest has been shown.

"I see a plant outside the United States first," says Dr. Bakarian of the RN process.

Forced Action—In part, the ven-

1960 Iron and Steel CONVENTION & EXPOSITION

Cleveland Public Auditorium

September 27-30, 1960

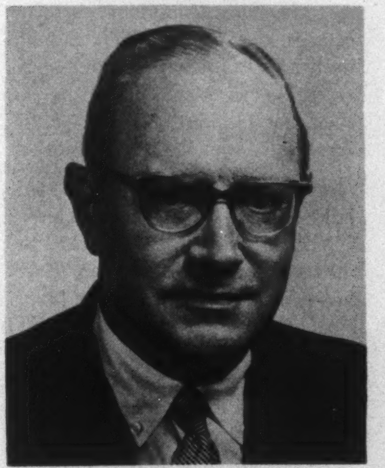
Show Hours:

Tues. and Wed. —10 am to 10 pm
Thursday —10 am to 5 pm
Friday —10 am to 4 pm

Technical Sessions:

Tuesday—9:30 am and 2 pm
Wed., Thurs. and Fri.—9 am and 2 pm

More Blast Furnace Research?



T. F. Olt, Vice President, Research, Armco Steel Corp., Middleton, O.

"New and improved techniques for operating blast furnaces are being developed at as fast a pace as in any period in the history of blast furnaces.

Steady progress is being made in the upgrading of all raw materials which are used in iron production. Ore is being beneficiated and agglomerated on a greater scale than ever before. Much attention is being given to the cleaning and preparation of coal and the sizing of coke and stone.

A host of new automatic controls and materials handling equipment have become available and are being used in all phases of blast furnace operation. All of these improvements generally are contributing to more efficient and more productive furnace operations.

Looking ahead, it would appear that all of the present day advances are stimulating additional study and experimental work in iron smelting processes and techniques. All of this intense research will surely result in still higher levels of efficiency and output in pig iron production in the future."

OPEN-COIL ANNEALING: J. A. Bauscher, vice president, research, Lee Wilson Engrg. Co., says it's easy to alter the composition of steel coils.

turesome attitude of foreign mills is forced by circumstances. Direct reduction, continuous casting and basic oxygen vessels all get away from the mass volume and massive spending of standard steelmaking processes. With limited funds and markets, many countries must scale their programs along modest lines.

"I don't know whether it's a question of having the courage for new processes or not having the money for old ones," reports an equipment man on this respect.

In addition, a new process faces the toughest kind of competition in this country. What may be practical in a new steel area will often not make sense in a nation with 400-ton openhearths and blast furnaces that turn out 2000 tons a day.

"We can't afford to be technically romantic," says one American steelmaker.

Faster Movement—In any case, the pattern still seems to be to let foreign countries bring new ideas through early development stages. Then, the promising ones are picked up here. The big change seems to be that we are moving earlier and more rapidly in the advanced development of new processes and in the modification of old ones.

This is a major change. Steel mills today are rushing to try practices that years ago had been dismissed as too costly. Several factors seem to have jolted old fixations and stimulated new thinking. Among these factors are: reports on Russian steelmaking; the success of basic oxygen vessels; and the appearance of many new processes.

Much of the current modification is so drastic and on such a wide scale that it constitutes basic change. Steel mills are talking about operating openhearths like oxygen vessels and oxygen vessels like openhearths. Ore beneficiation has been carried to the point where it is a major part of the steelmaking process.

However, the basic oxygen process provides the best example of the kind of thing this country is doing and isn't doing. The first LD vessels were put into service in Austria in 1952. These were 33-ton units. By the start of 1960, something like 50 vessels had been installed or contracted for—in foreign countries.

Slow Start—The first units in this country went into service at McLouth Steel Corp. at the end of 1954. The second installation, at Jones & Laughlin Steel Corp., was about three years later. Following the J&L job came a string of projects that still continues.

American producers held back at the start of oxygen steelmaking; but once convinced, they moved much more rapidly than Europeans to get the most out of the process. McLouth Steel's early vessels are rated at 60 tons. The first J&L vessels at Aliquippa, Pa., have a rating of 80 tons. Kaiser Steel Corp. installed 100-ton vessels in 1958 and Colorado Fuel & Iron Co. is now putting in the same size units.

For its new program at Cleveland, J&L is installing vessels rated at 200 tons. National Steel Corp. has announced plans for 250-ton units at Great Lakes.

Rapid Gain—In five years, domestic producers have increased vessel size ratings by a factor of four. In a longer period, foreign mills have scheduled only two LD vessels in the 100-ton range. Most foreign units run under 60 tons. National Steel vessels will have capacity for two million tons a year. This will be double anything that is now operating abroad.

These figures are more than just a display of sheer brawn. In its 80-ton vessels, J&L is making steel at the rate of 100 tons per hour. Steel men figure larger vessels will require no longer heat times than the smaller ones. They predict future production rates of 200 tons per hour or better.

Another oxygen process is running into a similar split in domestic and foreign thinking. The Stora-Kaldo system has attracted wide interest in this country. However, process backers have based their predictions, for American performance, on data gained from a small Swedish vessel. So far, no American mill has been willing to go ahead on this kind of data. However, one is now close to a decision.

Foreign Venture—With the same kind of information, the French mill at Sollac decided to install two 110-ton vessels of the Kaldo type. Early reports from Sollac have been favorable. Further operations should provide definite answers. Americans want these answers first: The French were satisfied they could predict the answers in advance.

"Europeans are much more inclined to trust theory than we are," says a process developer.

It may also be that Americans are

slower to accept an interesting new process until they are sure they have gotten the most out of the old one. In the direct-reduction field, this attitude has given new processes a moving target to hit. Mills keep finding ways to make blast furnaces more and more efficient.

Indirectly, this progress firms up tougher competition from another direction. The increased supply of hot metal is helping to depress world scrap prices. One major mill says it would go into direct reduction now —if it weren't for low scrap prices.

Real Progress—Nevertheless, real progress is being made in new ironmaking methods. RN facilities are solidly booked for pilot tests for the rest of the year. Canadian, African and Scandinavian ores have been tested this year. New facilities for converting bituminous coal and balling concentrates have been added by RN.

Strategic Materials Corp. recently got the "go ahead" on a Venezuelan project that could someday have a capacity of more than one million tons a year. Two live projects, involving the Strategic-Udi process, are in the works in Texas. Canadian and Arizona installations are under active consideration.

In addition, Strategic Materials has entered into an agreement with Universal-Cyclops Steel Corp. for testing its process in conjunction with stainless steel production. Strategic is building a big new plant to process chrome and nickel ores.

Test results with low-grade manganese ores indicate another major breakthrough, says Strategic Materials.

The Dwight - Lloyd McWane method is being used to produce iron for cast iron pipe. A 150,000-ton plant of the HyL type was announced last year by Premium Iron Ores, Ltd. Bethlehem Steel has a new H-Iron plant on the West Coast.

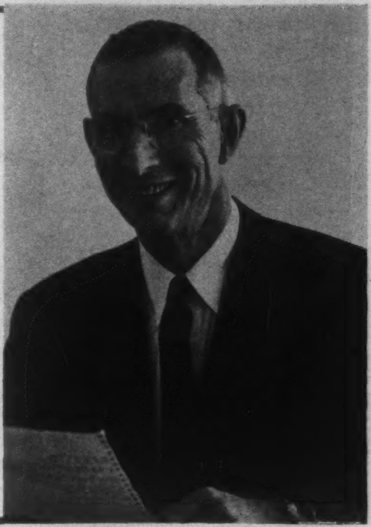
Continuous Casting — Another process may soon be ready for its tonnage debut in this country. Continuous casting is attracting new interest in domestic steel circles.

One reason for this is that new projects abroad will give a chance to evaluate the process for handling large chunks of steel in slab form.

Most of the 13 continuous-casting machines in commercial operation are used for billets and bars. Working with small shapes, the process has a practical limit of about 100 tons an hour. To go higher, you need more than eight strands. In such a case, operation becomes quite complex.

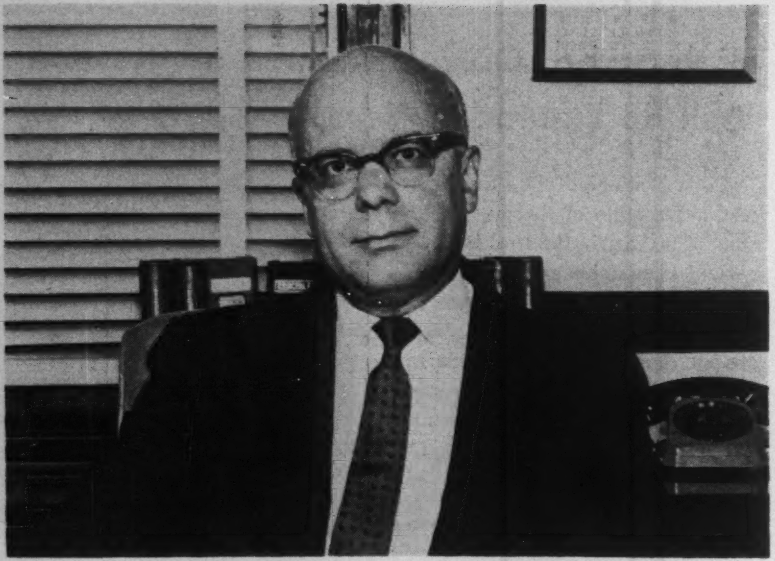
Atlas Steel runs some stainless slabs now, and larger operations are coming into service. United Steels, Ltd., in England, is breaking in a casting machine that handles carbon steel slabs 5½ x 36 in. Yawata Iron & Steel Co. is building a single-strand machine that will turn out stainless slabs 5 x 48 in. A French

High-Carbon Output Will Be Expanded



T. A. Bedford, Kaiser Engineers, states: **"In spite of the present low state of activity in the steel industry, several companies are now considering the installation of the LD process. Savings in operating costs are the dominant factor in inducing steelmakers to consider this process. The low capital cost is also attractive for steelmakers in replacing obsolete or high-cost facilities.**

QUALITY ALLOY: W. W. Dyrkacz, quality mgr., Allegheny Ludlum Steel Corp., inspects part made of consumable-electrode, vacuum-melted alloy.



VACUUM DEGASSING: A. M. Aksoy, research mgr., Crucible Steel Co. of America, predicts rapid growth for the vacuum-degassing process.

unit is being designed to cast 8-in. slabs.

Batch Disposal—With units of this size and type, the tonnage limitations of continuous casting may become a thing of the past. According to one authority, a four-strand slabbing machine can handle 400 tons an hour with no difficulty. This would answer the need of American steel mills to dispose of big batches of steel in a hurry.

There is one big exception to any comments on the passing of Yankee ingenuity. In vacuum melting, American producers have led the way through both development and production stages. This leadership is being maintained in current programs.

A. Finkl & Sons Co.

OXYGEN INJECTION: "Oxygen usage by the steel industry will increase . . . over present levels," says E. F. Kursinski, mgr., Air Products, Inc.

In the consumable-electrode field, at least three new furnaces will handle ingots of 40-in. diam or better and 40,000 lb or more in weight. Consumable-electrode remelting is now being applied to low-alloy steels. This material is going into large forgings for rocket-motor casings, into bearings and other vital applications.

Meet Missile Needs—Behind the move to bigger furnaces is the need of missile builders for large chunks of sound metal and the hope of suppliers that vacuum melting will capture a slice of the commercial forging market.

Rotor shafts for power generators are seen as a likely application. If this field develops for vacuum melting, still bigger furnaces may be coming. Rotor forgings now start with 72-in. ingots and go up as heavy as 600,000 lb in ingot form.

"A review of quality performance and growing consumer acceptance makes it easy to envision extremely rapid growth of this unconventional process in the coming decade," says W. W. Dyrkacz, manager of quality, Watervliet Works, Allegheny Ludlum Steel Corp.

Vacuum-induction melting is still used mostly for highly alloyed nickel- and cobalt-base metals. The process offers advantages for magnetic steels. However, right now, it's major use is for jet-engine parts.

General Pattern—The largest ingots now made by the induction process are 5000 lb. A 10,000 lb ingot is considered practical for the future. Dual-frequency furnaces give the most efficient combination of stirring and heating.

For the overall vacuum field, one authority sees development moving into a new phase.

"We are getting more and more into refinements of these processes," says A. M. Aksoy, manager, applied research laboratory, Crucible Steel Co. of America. "We're talking more and more about costs," he adds.

Dr. Aksoy sees induction melting moving on a plateau for some time. He sees continued growth for arc remelting, but at a slower rate than that of recent years. The process due for the greatest growth, he feels, is vacuum degassing.

Stream Degassing — Makers of the heaviest forgings have gone to stream degassing as a means of getting rid of hydrogen. Stream degassing and ladle degassing are now being used for certain die steels. However, a new system being installed by Crucible could pave the way for vacuum treatment of a wide range of materials.

Developed by Dortmund Horder Huttenunion, this system exposes small batches of steel to a vacuum. Steel is sucked from the ladle into a vacuum chamber. This system aims at removing oxygen and nitrogen as well as hydrogen. Backers of the process feel it improves quality. An increased yield will at least offset costs.

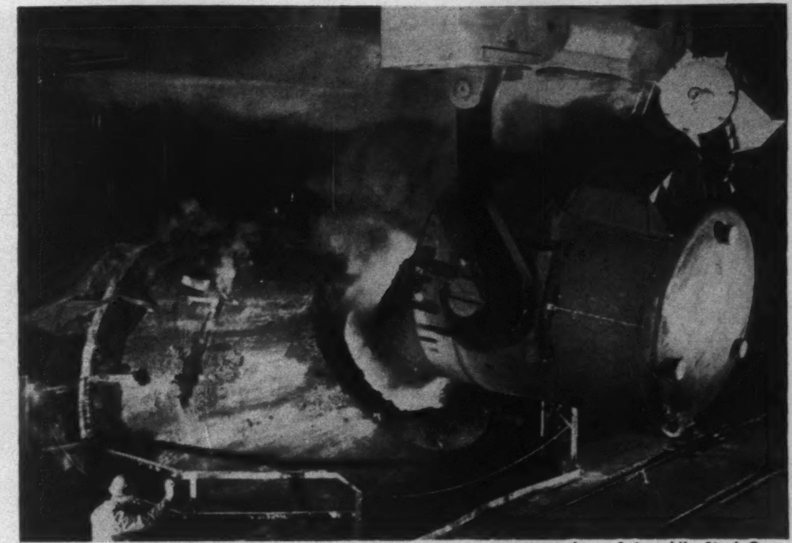
One of the hottest of the new developments seems to be the open-coil annealing furnace of Lee Wilson Engineering Co., Inc. According to the company, most of the major domestic mills are putting in these units. Another half dozen are going to foreign producers.

Open-Coil Alloying—Two years ago, Lee Wilson came out with an open-coil system. At the time, the big benefits discussed were speed and uniform heating. The annealing cycle is 7-10 days with standard batch methods. The prototype coil system permitted annealing in 10 hours.

Now, the Lee Wilson Co. is offering a system that can change steel composition during annealing. Carbon can be taken out. Nitrogen can be added or removed. The main difference from the original open-coil system is that the composition of the annealing gas is controlled.

In ordinary annealing, the gas simply blankets the steel and prevents oxidizing. In the new system, the atmosphere plays a vital part in controlling the steel's chemistry.

Heating and cooling are rapid with the new system, says Lee Wilson, but composition changes take time. For direct white-enameling steel, the annealing cycle is 15 hours. For non-aging steel, where nitrogen and carbon must be removed, annealing takes 25 hours.



Jones & Laughlin Steel Corp.

BASIC OXYGEN FURNACE: Hot metal is transported to a basic oxygen furnace. The charge consists of scrap, hot metal and other materials.

Better Production Rates—"The simplest way of saying what this means is that you can now do things with large coils that formerly could be done only on a very small scale with lab equipment," says John A. Bauscher, vice president of research at Lee Wilson.

There are many other processes being checked, tested and tried. United States Steel Corp. has taken out a license on pressure casting. A major stainless producer is now running tests on pressure-cast slabs. However, from a standpoint of dollars and tons, the most important activity in this country involves new uses and new modifications for old processes.

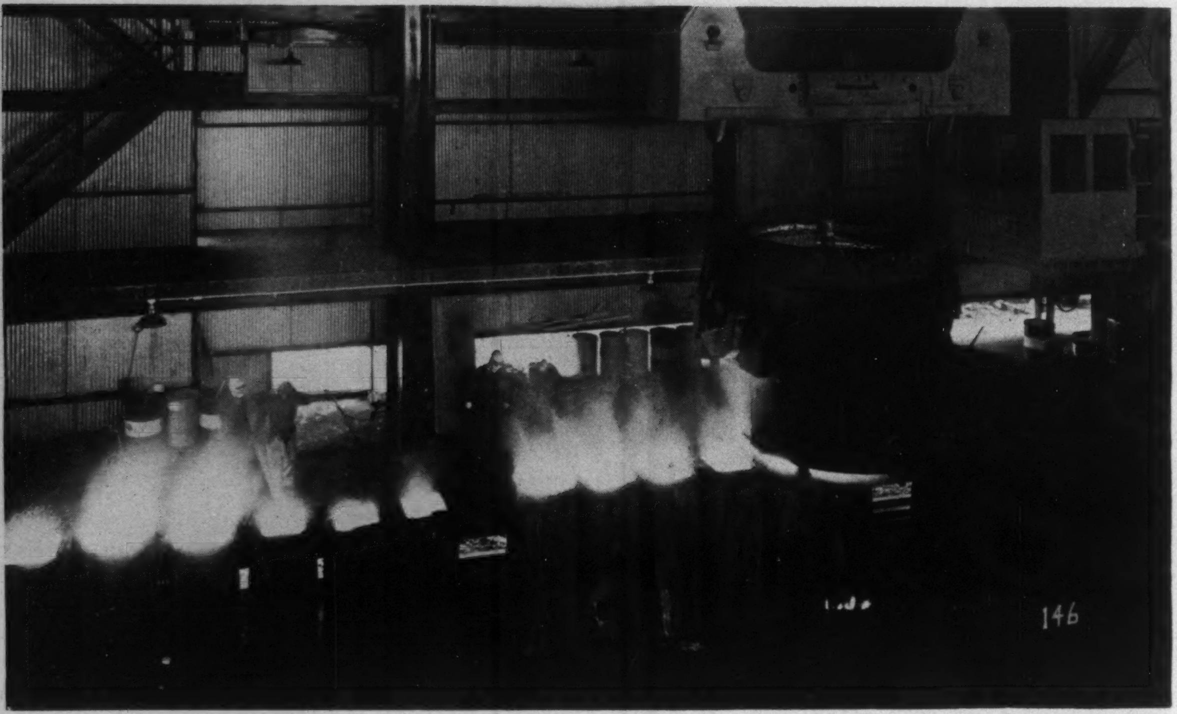
Ore beneficiation comes roughly under the heading of a new use for an old process. Mills have been agglomerating material for years. However, with 65-million tons of sintering capacity and with ore being upgraded from 30-pct Fe in crude form to 68-pct Fe in concentrated form, beneficiation is more a revolution than a modification.

Total Beneficiation?—It is pretty well established that all ore going into blast furnaces will someday be beneficiated. Questions of where and how are still being worked out. The superior performance of pellets in recent months has raised all kinds of complications. Mills are trying to decide whether pellets are so much better that they warrant crushing all ore to fine sizes.

According to one ore group, the picture shapes up this way: Lean, coarse ore will not be crushed at all. Low-grade ores that require a fine mesh for concentrating will be pelletized. Low-grade ores that can be concentrated in relatively coarse form will be sintered in some cases, pelletized in others. All sinters will be prefluxed.

As it stands now, the cost of prefluxing pellets isn't attractive. Ore briquettes are seen as specialized products for openhearth use. Directly related to beneficiation is the spurt in blast furnace efficiency.

Improved Efficiency — "I don't think anyone would disagree that beneficiation of raw materials, including coal, has been the biggest factor in improved blast furnace



Jones & Laughlin Steel Corp.

BETTER QUALITY STEELS: After the heat of steel is tapped from a basic oxygen furnace, it's teemed into ingot molds. These molds are then moved to the soaking pits. Test work points to greater use of oxygen.

efficiency," says Owen R. Rice, Koppers Co. Inc.

Uniform burdens have brought direct benefits, says Mr. Rice, and they have made possible new practices and new controls. Taken together, these changes have increased furnace output rates more than 26 pct over the past 10 years. They've reduced coke rates more than 13 pct.

For the future, Mr. Rice sees more iron being made in large furnaces—28- to 30-ft in hearth diameter. He predicts production rates of 2500-3000 tons per day as a regular thing. The best furnaces may be hitting 3500 tons a day.

Mr. Rice predicts higher blast temperatures, higher top pressures and a high degree of beneficiation. With gas injections, he views coke rates down to 1000 lb.

Fast Reactions — The best example of fast reactions today is afforded by openhearth men. Within a year of the development of a practical basic roof, more than 100 furnaces had been converted to all-basic construction. Just as fast, mills stepped up oxygen dosages for openhearths.

Today, the best openhearth shops are making about 40 tons an hour. They average between 500 and 700 cu ft of oxygen per ton of steel. Test work points to even greater use of oxygen.

"At present, experimental programs at several steel mills use oxygen consumption levels of 1400-1800 cu ft per ton of steel produced," says E. F. Kursinski, manager of applied research and development, Air Products, Inc. "At these higher levels of oxygen consumption, steel production is generally doubled."

Promising Future—How far this trend will go, in converting openhearths into oxygen vessels, remains a question. Mr. Kursinski points out that the methods being tested call for openhearths to use as much oxygen as the vessels. Results with gas injection from roof jets have led some authorities to speculate on the complete elimination of end burners and checkers.

Something close to this has been done in England at the Appleby-Frodingham Steel Co. Applying 1270 cu ft per ton of steel, the English mill is getting most of its heat from oxygen reactions. However, the mill is using 100-pct hot metal with 1.0- to 1.25-pct phosphorous.

One openhearth man in this country doubts that this kind of modification will ever become widespread. While there may be savings to be gained from remaking openhearths, some sources feel there will be even greater savings from basic oxygen vessels.

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MENIHEK LAKE
CARRYORE LIMITED

FULL SPEED AHEAD—One of the largest ore boats on the Great Lakes, Menihek Lake, brings in Labrador ore.

Steelmakers Plan Pellet Plants To Head Off Foreign Inroads

Domestic iron ore producers set their sights for record output, with U. S. pellet programs leading the way.

Foreign competition is still strong. But fresh philosophy by the locals points up new roads to progress.

By **T. M. Rohan**—Cleveland Regional Editor

▪ Blast furnace operators in steel mills these days are the fair-haired boys of the operating department. The popularity enjoyed by the blast furnace men is because they are making a steel mill boss's dream come true.

The dream is to produce more iron with the same old blast furnaces. These now go for $25 million to $40 million including allied equipment.

The breakthrough has come from upgraded iron ore combined with whole new techniques of blast furnace operation. It's the hottest subject in both the iron ore and blast furnace pictures.

Demand for Pellets — Producers of pellets are in a seller's market with customers scrambling to get the output. This comes at a time when direct shipping ores are a drug on the market and dozens of Great Lake ore boats have gone into early layup.

Total shipment of pellets from U. S. and Canadian plants has gone up at an astonishing rate—in the face of a general loss of markets for direct shipping ores to foreign sources.

Shipment of pellets hit a million tons a year for the first time in 1955. They jumped to 4.8 million in 1956 when Reserve hit its stride. In 1957 they reached 6.8 million when Erie Mining Co. came in strong. In 1958, despite the slowest season on the lakes in 19 years, pellet output was 9 million tons.

The strike kept it about the same last year. This year, despite the let-down, output should top 12 million tons. Over 95 pct of the pellets are from U. S. plants and the rest from Canada.

Business Outlook—"There is no doubt that ore in the future will have to be high-grade ore to satisfy the customer," says H. Stuart Harrison, Cleveland Cliffs president.

"And it is obvious that anyone who is going to remain in the iron ore business must be important in both foreign ores and low grade development. Many of the foreign ores, particularly those in Canada, will be concentrates or agglomerates from low-grade ores."

The iron ore industry in the Lake Superior district is turning into a complex treating operation — and must do so to beat off the rush of foreign competition. There are now seven commercial taconite plants in U. S. and Canada.

Reserve Mining — the first big new U. S. taconite plant—is being expanded 50 pct at a cost of $120 million and will have 9 million tons per year capacity of upgraded ore.

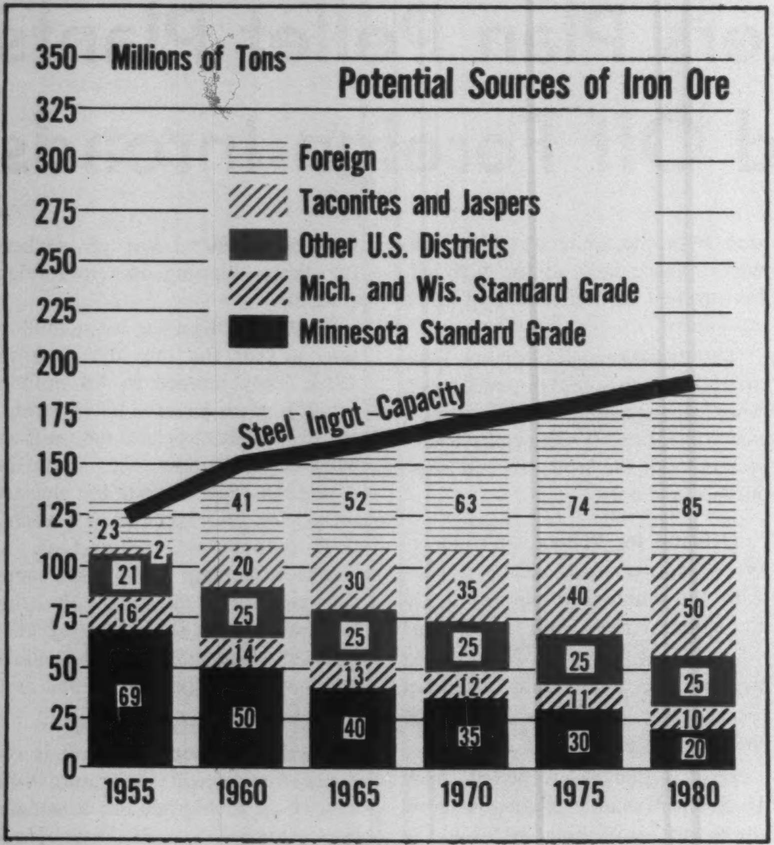
Erie Mining Co. shipped out about 3.5 million tons last year despite the strike. This year should top it, despite a glut of ore at lower lakes ports which has put about 150,000 tons for sale on the open market.

Pilot Plants Advance—Research and pilot processing also continues at a stepped up rate. Based on the success with taconite, two big mining firms—Oliver Iron Mining Div. of U. S. Steel and M. A. Hanna Co. —are going into semi-taconite on the western Mesabi range.

This will open whole new areas of mining activity if successful. Millions of tons are easily accessible but efforts to use them failed years ago. But proponents feel their time has come at last.

Semi-taconite is non-magnetic and difficult to separate. The new technique involves a large rotary air-tight kiln in which ore is heated to 950° to 1225°F — eventually becoming magnetic. It can then be ground and concentrated like magnetic-type taconite.

How Ore Sources Affect Output



Need Promotes Expansion — Cleveland Cliffs Iron Co. is successfully recovering non-magnetic ores in Upper Michigan at its Humboldt mine. Here low grade, non-magnetic jasper ore is being pelletized in a combined grate and rotary kiln.

Allis-Chalmers Mfg. Co., Milwaukee, and Arthur G. McKee Co., Cleveland, are cooperating in design and construction of the new plant based on an old European cement plant practice.

Cleveland Cliffs is the only independent pellet producer in the U. S. selling regularly on the open market. As such, it is the only major place a steel firm can get a steady supply of pellets without joining a multi-million dollar project.

This has been a long-standing hurdle for many steel firms who don't want to put up, or haven't got the money to join the taconite club.

New Ventures — All Cleveland Cliffs pellets which don't go to its Ford Motor Co. partner are on allocation. Demand is so high that only occasional small shipments of pilot lots can be sent to experimenters.

Iron content is about 61.75 pct Fe natural. Some other pellets are sold independently by International Nickel Co. where they are turned out as a by-product of nickel mining at Sudbury, Ont. These go mostly to Canadian firms and are used as openhearth feed.

Besides Erie, Pickands Mather also has a pellet plant at the Hilton Mine near Ottawa. Bethlehem is also building one of 2 million tons capacity at the Grace Mine in Pennsylvania and has a similar venture with St. Joseph Lead Co. in Missouri.

The giant of the range—U. S. Steel—is making both sinter and pellets in different areas. This indicates there is no clear cut superiority in either type where there are other variables. At its new Wyoming mine for Columbia-Geneva Div., it will use pellets.

Studies Higher Grades — U. S. Steel's Quebec Cartier is reportedly looking into concentrating at the mine and sintering at the mill. With high grade direct shipping ores generally, coarse grades can be most economically charged directly into furnaces. Also, fines can be sintered.

Oliver last year shipped over 15 million tons of all types of iron ore, more than the second and third ranking producers combined. In 1957 it shipped 33 million tons.

The ore beneficiation goes hand in hand with more iron from blast furnaces. The "more" runs from a minimum improvement of about 20 pct to almost 90 pct.

The latter record which stunned the industry earlier this year, has been achieved on long runs by Armco Steel Co. at Middletown, O. A furnace rated about 1500 tons per day there has achieved daily production records of 2700 to 2800 tons of pig iron yield.

Uses Pellet Charge — Armco is fortunately so situated that it can use a full pellet charge with no direct shipping ore. The usual slag, stone and other elements are also added, of course.

The limiting factor on production is not the 28-ft furnace size but the handling and cooling capacity for that tonnage of iron.

Other steel firms could probably equal the record and actually are setting pig iron production records.

However, due to commitments and/or geography, they must blend pellets with other ores to which they are committed.

Upgrading with sinter also raises blast furnace yields, of course. Sinter is principally ore and flue dust heated to the point of fusion of the iron. Limestone flux is added directly, too.

It is especially useful where there is a heavy percentage of fines which are easily lost if fed directly into a blast furnace. Twenty-nine big sinter plants have been built in the last several years with capacity over 30 million tons.

Increased Yield—Proponents of pellets feel they have a clear cut superiority.

It's felt that the acid-type pellets will yield at least 10 pct more iron than sinter even though the sinter is fluxed.

HITTING ITS STRIDE: Total shipment of pellets from U. S. and Canadian plants increases each year. In 1960 it should top 12 million tons.

This is principally because more wind can be blown through the pellets than through the sinter. In addition, less coke will be used if the coke used in making the sinter is taken into account.

The higher yields from beneficiated ore are not without some sacrifices, of course. However, none have been big enough to keep operators from going into beneficiated feeds where they can.

Chief among the obstacles is more wear and tear on blast furnace linings. Up to 70-pct loss of lining life has been experienced and 50 pct is not unusual. The full problem is not even known yet.

Lining Solution—The most prevalent theory on lining life is that direct shipping ore leaves a protective deposit on the face of the refractory brick where pellets do not. As iron is melted down, the unprotected brick is worn off by abrasion.

A contributing factor is that, with richer upgraded ore, there is more hot metal in the furnace so linings must withstand more total heat. The solution appears to be in thicker, more abrasion-resistant linings.

In present practice with pellets, operators must hold back to avoid burning out equipment not designed for the volume of iron going through.

For one, furnaces are not used with maximum burden because level of hot metal must be kept below the water-cooled copper slag notch or it would exceed the cooling capacity and burn it out.

Time must be allowed to rebuild the runners, down which the molten iron flows. Stockhouses must step up their pace also and the skip hoist does double duty.

New Trends in World Steel Brighten U. S. Outlook

By **R. W. Hardy** and **J. S. Revis,** Economists, Harrisburg, Pa.

The strike forced many American companies to get steel from foreign sources.

Do steel imports pose a threat to our future? Will U. S. exports continue to exceed imports? This summary of a broad study points up a few answers.

▪ The big steel news in 1959 was, of course, the record-long strike. That same year also accounted for a new high, over four million tons, in imports of steel mill products. Even though the strike is over, imports of these basic products continue to pour through U. S. ports.

Shapes, plates, rails, bars, pipes and wire products make up these imported steel shipments. Industry wants to know whether new trends in world trade are developing. Where does the steel come from? How is it priced? Which items are popular?

The most realistic way to judge the impact of imported steel is to compare its volume with the total domestic supply. In 1959, this ratio was 6 pct—more than twice as much as the previous high set in 1951.

After the Wars—Both post-war decades, the 1920's and the 1950's, were periods of prosperity. During the "twenties," the import ratio averaged 0.9 pct. The ratio doubled in the more recent decade. This change points up a long-range shift in trade patterns.

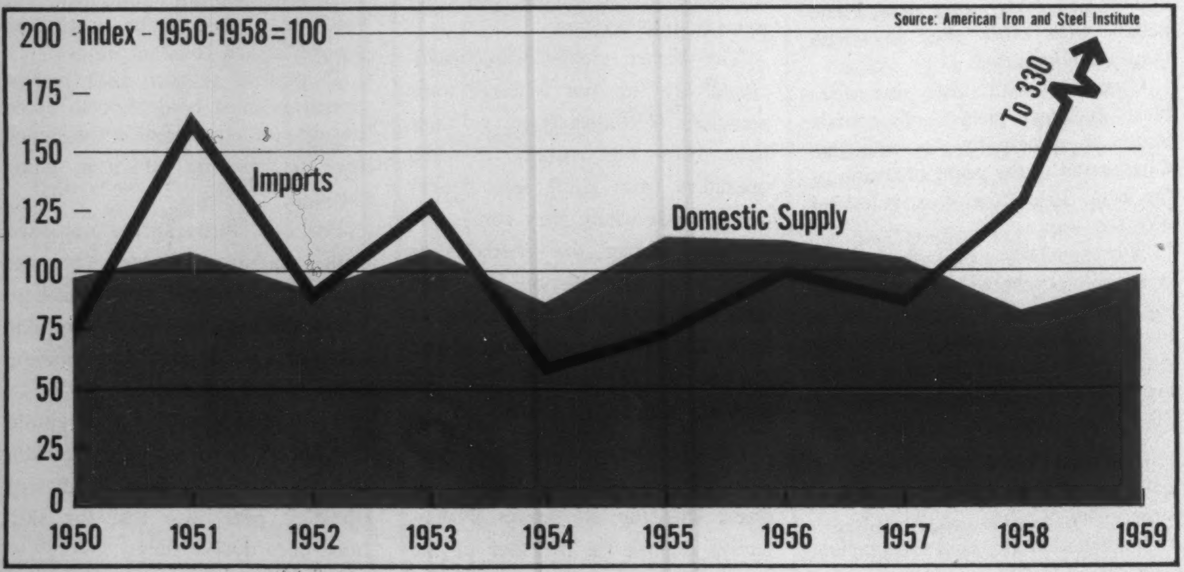
However, exports have outdistanced imports. This fact may offset any decreases in production and employment resulting from increased imports.

The relative popularity of eight major types of steel mill products has undergone wide changes during the 1950's. Take bars and tool steel, for example. In 1950 these two items accounted for 17 pct of import volume. By 1958, their share soared to 38 pct.

Other Products — During the same period, wire and wire products increased from 10 to 27 pct. On the other hand, steel shapes and plate declined from 33 pct in 1950 to 10 pct in 1958.

Also during the past decade the demand for imports moved right along in the same direction as the demand for domestic steel. Import demands, however, were more pronounced. As such, imports seem to

How Imports Affect Domestic Supply



Source: American Iron and Steel Institute

Bars and Tool Steels Head the Overall Shipping List

BREAKDOWN OF IMPORTED STEEL MILL PRODUCTS, PCT

Year	Semi-finished Steel	Shapes and Plates	Rails and Accessories	Bars and Tool Steel	Pipe and Tubing	Wire and Wire Products	Tin Mill Products	Sheets and Strip
1950	28.9 Pct	33.3 Pct	0.7 Pct	16.7 Pct	4.0 Pct	10.1 Pct	0.4 Pct	6.0 Pct
1951	12.1	47.7	0.5	17.6	11.0	6.0	....	5.0
1952	8.9	38.6	0.4	20.0	23.2	5.2	0.2	3.5
1953	11.9	35.0	0.2	12.4	14.2	6.6	....	19.6
1954	6.2	16.2	0.5	37.9	19.2	25.8	....	3.3
1955	20.0	11.5	0.8	29.8	7.9	26.0	....	4.1
1956	6.9	29.9	0.6	29.9	10.5	19.3	0.1	2.7
1957	5.4	25.2	0.5	22.8	16.6	27.1	....	2.4
1958	11.7	10.0	0.3	38.1	11.7	26.6	....	1.5
1959	12.3	18.2	0.2	30.5	12.6	17.1	1.5	7.6

SOURCE: Adapted from data published by the American Iron and Steel Institute; Annual Statistical Reports.

be more sensitive to cyclical changes.

From 1957 to 1958, the indexes of imports and domestic supply moved in opposite directions. What caused this new pattern? For one thing, the ratio of foreign to domestic steel prices shifted downward. Also, compared to imports, domestic shipments didn't recover as rapidly.

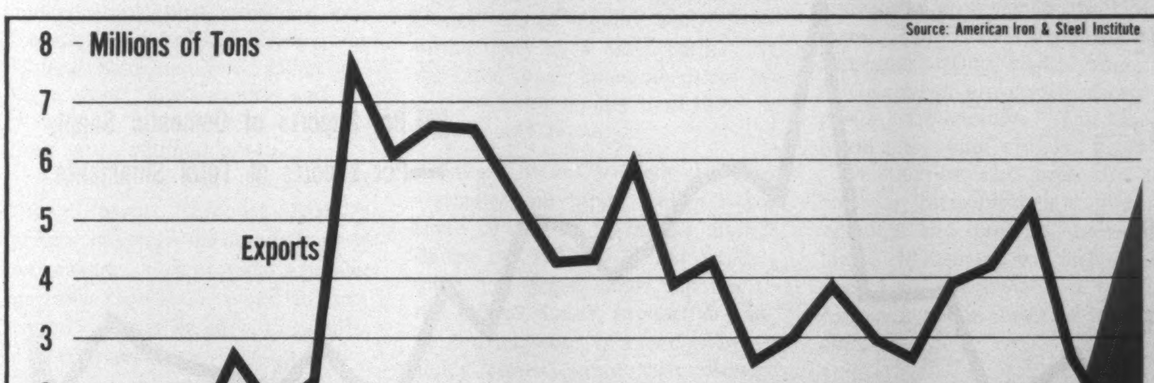
Skidding Market — Changes are very apparent within the main item of wire and wire products. Notice what happened from 1951 to 1958. The domestic supply of barbed and twisted wire decreased from 231,000 tons to 114,000 tons. Conversely, imports rose from 7,000 to 59,000 tons.

In the same period, woven wire fence and wire nail and staples displayed similar patterns. Domestically, fencing fell from 405,000 to 195,000 tons. Imports went up from only 1,500 to 40,000 tons. In wire nail and staples, the ratio of imports to domestic supply increased from 6 to 32 pct.

Points of Shipment—Where does the imported steel come from? From 1953 to 1959, between two-thirds and three-fourths of all steel mill products imported into the United States originated from the European Coal and Steel Community. At the beginning of this period, Japan's share was 7 pct. By 1959, it climbed to 14 pct.

The biggest single supplier of

Strike Year Responds to Heavy Imports



steel during these seven years was Belgium-Luxembourg, whose exports to the United States ranged from 33 to 51 pct of U. S. imports.

Strike's Effect—The price pattern in wire products was another story. Price indexes remained stable for barbed wire and bright common wire nails until the strike. Then the import prices rose sharply.

Both import and domestic prices of certain wire rods increased until the middle of 1958. They then declined until the winter of 1959. In the spring of the same year, import prices began to climb. They even returned to their 1957 level soon after the start of the steel strike.

From January 1957 to September 1959, domestic prices of hot- and cold-rolled sheet increased 8 pct. In contrast, import prices on both grades decreased 2 pct. In July, hot- and cold-rolled sheet showed a decline of 16 and 3 pct, respectively. Yet in October, prices on imported sheet climbed back above the January 1957 level.

Home Costs—How have the domestic prices compared in plate, rails, billets, rods, sheet and structural steel? The price indexes of these products in the United States and the United Kingdom ranged, in December 1958, between 24 and 48 pct above the base period of 1951-52.

At the same time, the price indexes in Germany and Belgium ranged 1 to 25 pct above the base period. Product price indexes in France showed little change.

Since 1951, U. S. steel export prices have increased. Foreign steel export prices have either declined or increased at a lesser rate than those in the United States. Nevertheless, the relative volume of steel imports. from the United States has been influenced more by business conditions at home than differential price changes.

On the other hand, some shifts in the relative importance of selected steel mill imports appear to be related to changes in the ratio of domestic to import prices.

Clue to Prices—Between January 1957 and November 1958, domestic steel prices of concrete reinforcing bars rose relative to import prices. These increases were associated with an average lag of three months, to increase the ratio of imported concrete reinforcing bars to domestic supply.

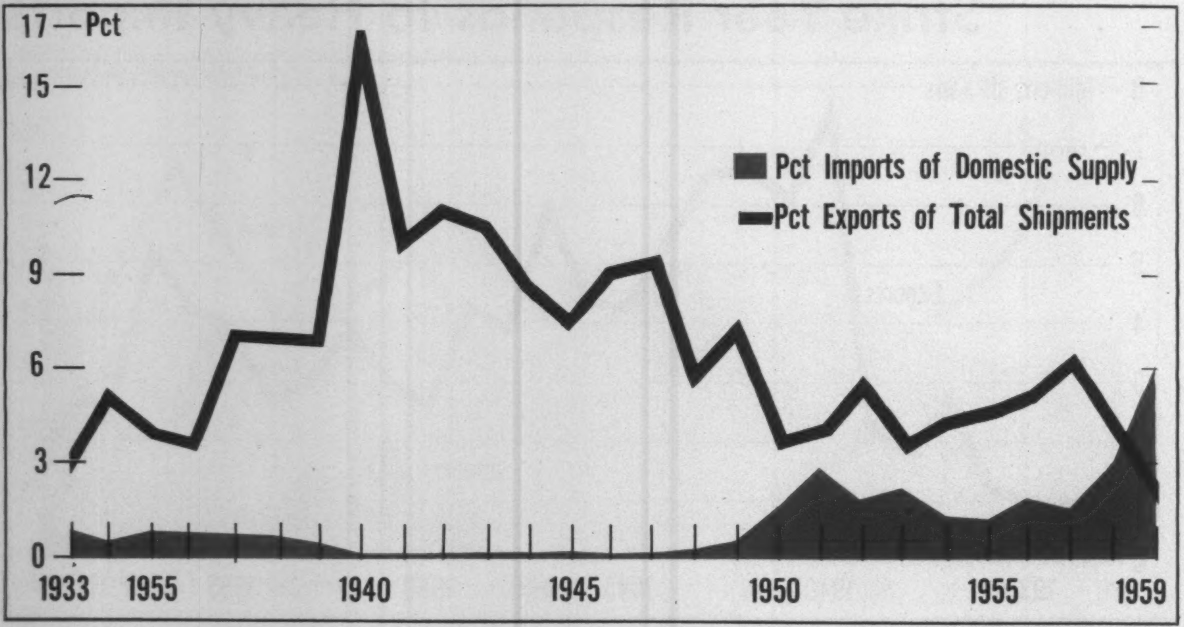
For the remainder of the period, the price went down; so did the ratio of concrete reinforcing bars to domestic supply. Wire nails were in the same boat.

The evidence suggests that a change in the terms of trade has resulted in a change in the market position of certain imports. These imports include reinforcing bars and wire nails and other items that require limited finishing.

South of the Border—About 30 pct of American steel exports in 1957 were shipped to Latin America. Tonnages were on a par with those from Western Europe and Japan. However, from 1957 to 1958, total U. S. exports to Latin American countries declined 46 pct.

While American exports dipped; Common Market shipments increased by 5 pct. United Kingdom exports dipped a slight 4 pct. Japan enjoyed a huge gain: 344 pct. Of

Foreign Trade Cuts Into U. S. Market



Belgium-Luxembourg Is the Leader in Imports

YEARLY IMPORTS OF STEEL MILL PRODUCTS, PCT

Country	1953	1954	1955	1956	1957	1958	1959
Belgium-Luxembourg	41.7 Pct	50.6 Pct	36.5 Pct	45.0 Pct	41.6 Pct	45.7 Pct	32.7 Pct
France	15.7	16.7	16.1	19.3	15.5	9.4	13.3
West Germany	8.6	15.5	8.2	11.7	16.4	11.8	16.5
Netherlands	7.2	2.0	1.6	2.1	2.3	2.9	2.0
Italy	1.5	0.8	0.3	1.6	1.4	0.7	1.4
Total European Coal and Steel Community	74.7	85.6	62.7	79.7	77.2	70.5	65.9
Japan	7.1	3.0	9.9	3.6	2.7	14.7	14.2
United Kingdom	5.0	5.1	4.9	4.5	5.0	5.0	4.9
Canada	10.8	3.1	19.1	4.4	4.5	2.7	8.6
All Other Countries	2.4	3.2	3.4	7.8	10.6	7.1	6.4

SOURCE: The American Iron and Steel Institute, Foreign Trade Trends, 1958 and 1959 editions, Table 8.

course, steel export prices from the United States and the United Kingdom increased more than those of other countries.

On the world market, U. S. exports declined 48 pct, the United Kingdom dropped 13 pct and the Common Market dipped but 1 pct. Japanese exports, however, rose by 69 pct.

Flexibility—Foreign export prices have been more flexible than those of the United States. Naturally, differences in political climate and economic institutions are vital factors. First of all, Europe, the United Kingdom and Japan are big traders. Their exports and imports take a much bigger bite of their gross national products.

Secondly, in both Europe and Japan, export revenues have a greater influence on domestic price movements. This provides a greater incentive for these areas to vary export prices in an effort to stabilize export revenues.

Western Europe hasn't forgotten the post-World War I days of "galloping inflation." For this reason, it keeps a keen eye open to the threat of price inflation. Such nations, therefore, try to maintain stable balances of payment.

Vantage Point—Most European countries and Japan, due to their political and economic structure, can partake actively in the formulation of price policies.

All things being equal, it's generally agreed that prices tend to stabilize when the rates of increase in productivity are matched by the rates of increase in wages. They tend to fall when productivity increases faster than wages—and visa versa.

In the five-year period, ending in 1957, basic metal wages in the United States pulled away from productivity by 8 index points. At the same time, American prices increased more rapidly than those in Europe and Japan.

Large Shares — Both Western Germany and Japan took a larger share of the U. S. import market during the 1953-58 period. In Belgium, the largest single exporter to the United States, productivity exceeded increases in earnings by 14 index points—more than Western Germany or even Japan.

The wage-productivity spread within the United Kingdom was only 1 pct. Its price pattern was very similar to that of the United States, and the U. K. share of American imports declined during the five-year period.

Since the increases in productivity in Western Europe and Japan haven't been absorbed by wage hikes, you won't find too much pressure for raising product prices.

Brighter Outlook—Foreign countries have been making inroads into markets formerly covered by the United States, but these gains seem to be temporary.

What lies ahead? If full employment continues, foreign steel producers will soon be faced with the same price problems as the United States. Future steel expansion will encounter rising costs, from the exhaustion of low-cost iron ore deposits. Competitive demands on labor and capital will also figure in.

In America, steel producers will have to intensify their capital investment and research. In view of the world demand for high quality steel, the United States is likely to remain a net exporter in the years ahead.

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Is "Thinking" Computer the Key To Automatic Mill Control?

The debut of the computer-controlled mill is scheduled for next year.

Its ability to think—to make its own adjustments during a run—will be the focus of much attention.

By **C. L. Kobrin,**
Metallurgical Editor

▪ Two years ago, punch cards were leading the drive towards automatic steel mill controls. Now attention is beginning to focus on computers. They're taking over where punch cards leave off.

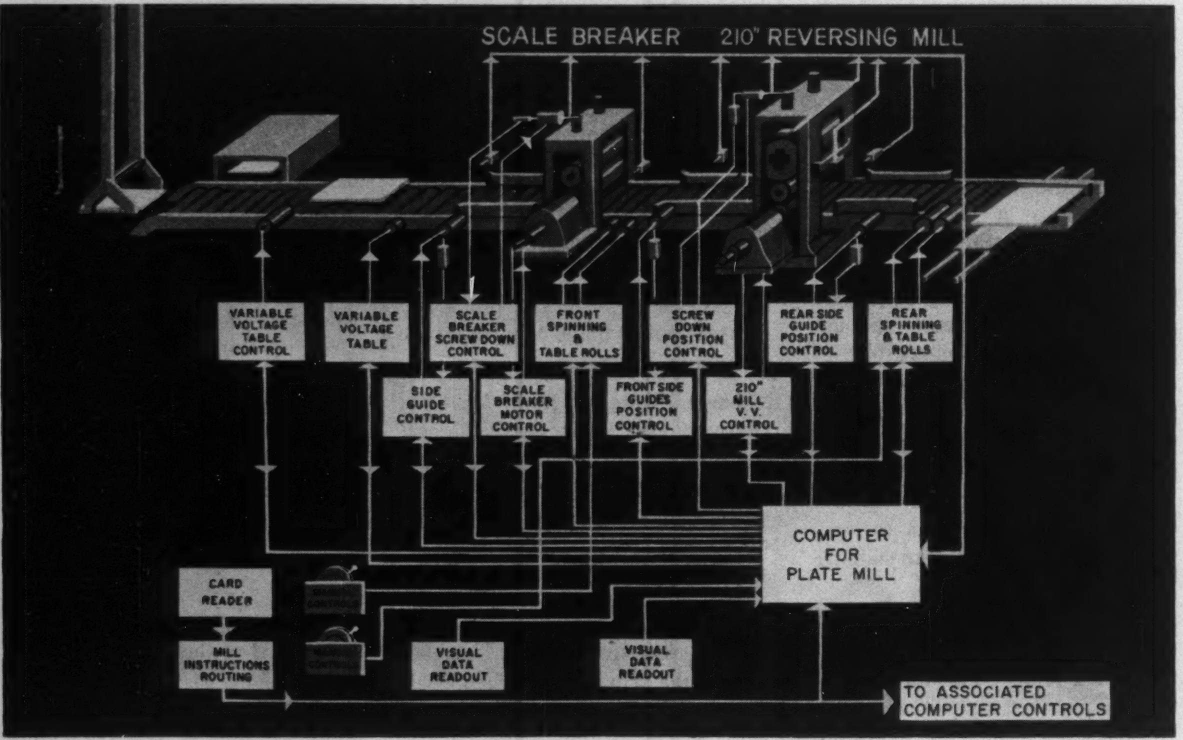
Computer controls are already being built for several steel mills. At least one will be in operation within the next year. Controls are by Westinghouse Electric Corp., Pittsburgh.

Cards Remain a Factor—This doesn't mean that punch cards are being eased out of the control picture—not by any means. For instance, much of the credit for the increased capacity at U. S. Steel's very modern structural mill at South Works, Chicago, is laid to card programming.

Consider the 53-in. blooming mill there. A scheduling device takes over when the ingot is still red hot. The proper punched card is inserted in the unit. And an ingot weighing as much as 40,000 lb is shuttled back and forth through the mill—finally emerging as a bloom of desired shape and size.

But a punch card program can get quite cumbersome. One steel plant roughing mill has over 20,000 different schedules. This means keeping a library of at least that many cards. Moreover, cards wear out and need replacing.

Computer Takes Over—The in-line computer does away with this problem. True, a punched card is still needed. All it need contain is the slab size and hardness, and the final size desired. The computer does the rest. The other data are stored in the computer which calculates the number of passes, the draft


SCALE BREAKER
210" REVERSING MILL
VARIABLE VOLTAGE TABLE CONTROL
VARIABLE VOLTAGE TABLE
SCALE BREAKER SCREW DOWN CONTROL
FRONT SPINNING & TABLE ROLLS
SCREW DOWN POSITION CONTROL
REAR SIDE GUIDE POSITION CONTROL
REAR SPINNING & TABLE ROLLS
SIDE GUIDE CONTROL
SCALE BREAKER MOTOR CONTROL
FRONT SIDE GUIDES POSITION CONTROL
210" MILL V. V. CONTROL
COMPUTER FOR PLATE MILL
CARD READER
MILL INSTRUCTIONS ROUTING
VISUAL DATA READOUT
VISUAL DATA READOUT
TO ASSOCIATED COMPUTER CONTROLS

COMPUTER RUNS MILL: Just feed the computer the slab size, hardness, and final size desired. It does the rest. Computer also notes any discrepancy after the first pass and adjusts the next passes accordingly.

and speed for each pass of the mill schedule.

Suppose the slab entering the mill is colder than expected. Measurements of torque, force, and plate thickness will point out this discrepancy to the computer after the first pass.

It then modifies the rolling schedule so that the plate will be rolled in the fewest number of passes. The computer can also predict the final length and temperature of the rolled plate.

Future Installation — The 160/210 reversing plate mill at U. S. Steel's Gary, Ind. works will be equipped by Westinghouse with a computer control of this type. The plate mill will handle slabs up to 24 in. thick and will turn out finished plates up to 125 ft long.

Development of the computer closes the automation control loop. First in the loop is a regulating system to monitor and control. Next is the programming control which uses punched cards, tapes or pushbuttons to instruct the regulating system to follow a certain pattern.

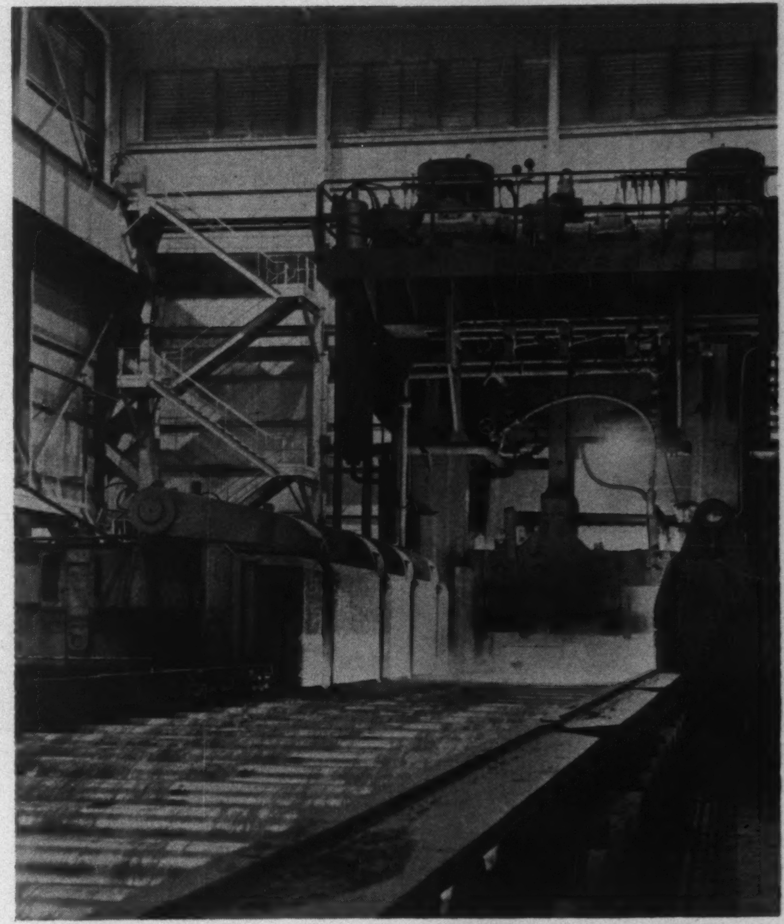
The third section of the loop is the data recorder. This system automatically obtains data from the mill for further use.

Studies the Data—The computer is the last element. It studies the recorded data and then re-programs the regulating system to improve the product.

Both the customer and the steel mill can profit from these improved products. Plate, for example, can be made to much closer tolerances. Thus, the customer will pay for just what he needs—not for any extra thickness.

Pipe can also be made to closer tolerances. This is vital to the steel mill which guarantees a minimum wall thickness—yet sells the pipe by the foot.

Need New Devices — Successful use of computers in mill operations depends upon the proper sensing devices to feed information. Westinghouse engineers point out that if certain new instruments were developed, the computers could do even more.



USES CARDS: Despite the growing interest in computers, punch cards are still in demand. This new 53-in. blooming mill is card programmed.

What's needed, for example, is a device to measure surface quality of moving strip. Based on the readings, the computer would be able to classify the product. And a complete record could be passed on with the coil. In some cases, the surface quality readings might cause the computer to reject the strip—either for reworking or for scrap.

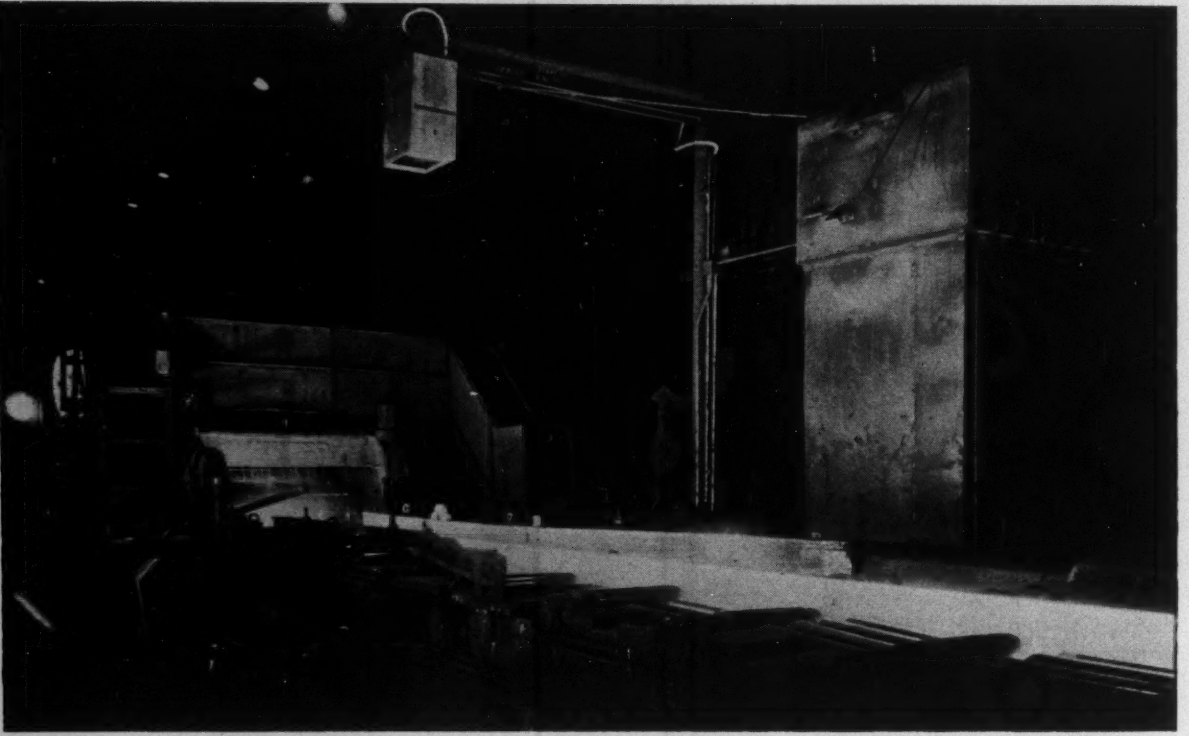
Also needed is a hardness sampler that tests moving strip without touching it. These data could be fed to a computer to control a continuous annealing line—to tell if the metal is properly annealed.

Strip Is Rated—If the strip is not up to specifications, the computer goes into action. It changes the combustion rate, for instance, and makes other needed adjustments to the line to result in metal of the right hardness. If the strip is beyond correction, the computer will label it as scrap.

A device of this type is not far-fetched. Already being designed is a way to measure tension of strip being rolled without deflecting or touching the metal.

What Else Is New?—Are computers being developed for other areas of the steel industry? What about other types of controls?

Another type of computer being considered is the central brain. It's purpose is to keep contact with all steel moving through the plant and to schedule all equipment. Suppose



SHEARS ON CUE: Scanner, in position over moving hot strip, locates right spot for cropping. It then relays information to the shear down the line for automatic cropping as the strip passes by.

a spindle in a strip mill broke. The computer would notify plant personnel which machinery should be turned off first and how much hot metal is located at various sites in the plant.

Although some work has been done on combustion controls, little emphasis has been laid upon computers for openhearths. This phase is not being overlooked, control experts hasten to point out. Both steel and control spokesmen agree that the LD converter is very adaptable to computer control.

It will be some time before you see an automated blast furnace. Steelmen feel that there is still a lot to be learned about the operation itself. Towards this end, much instrumentation is being developed to determine what's going on inside the furnace. U. S. Steel is building a model blast furnace to study all the variables.

How About the Charge?—One control approach to the blast furnace is to control the raw materials: size, consistency, chemistry, and the proper proportion.

Westinghouse and U. S. Steel again team up to point up this trend. At the Gary Works, an operator will be able to prepare a program for drawing raw materials from the hoppers, and weighing, mixing, and getting them to the furnace at the right time.

When the program has been set up on a switchboard-type control, the charging cycle proceeds automatically.

Data on raw materials and the time at which they are charged into the furnace are recorded. In addition to providing a breakdown for accounting purposes, the figures allow a comparison of the charging program with the quality of the finished product.

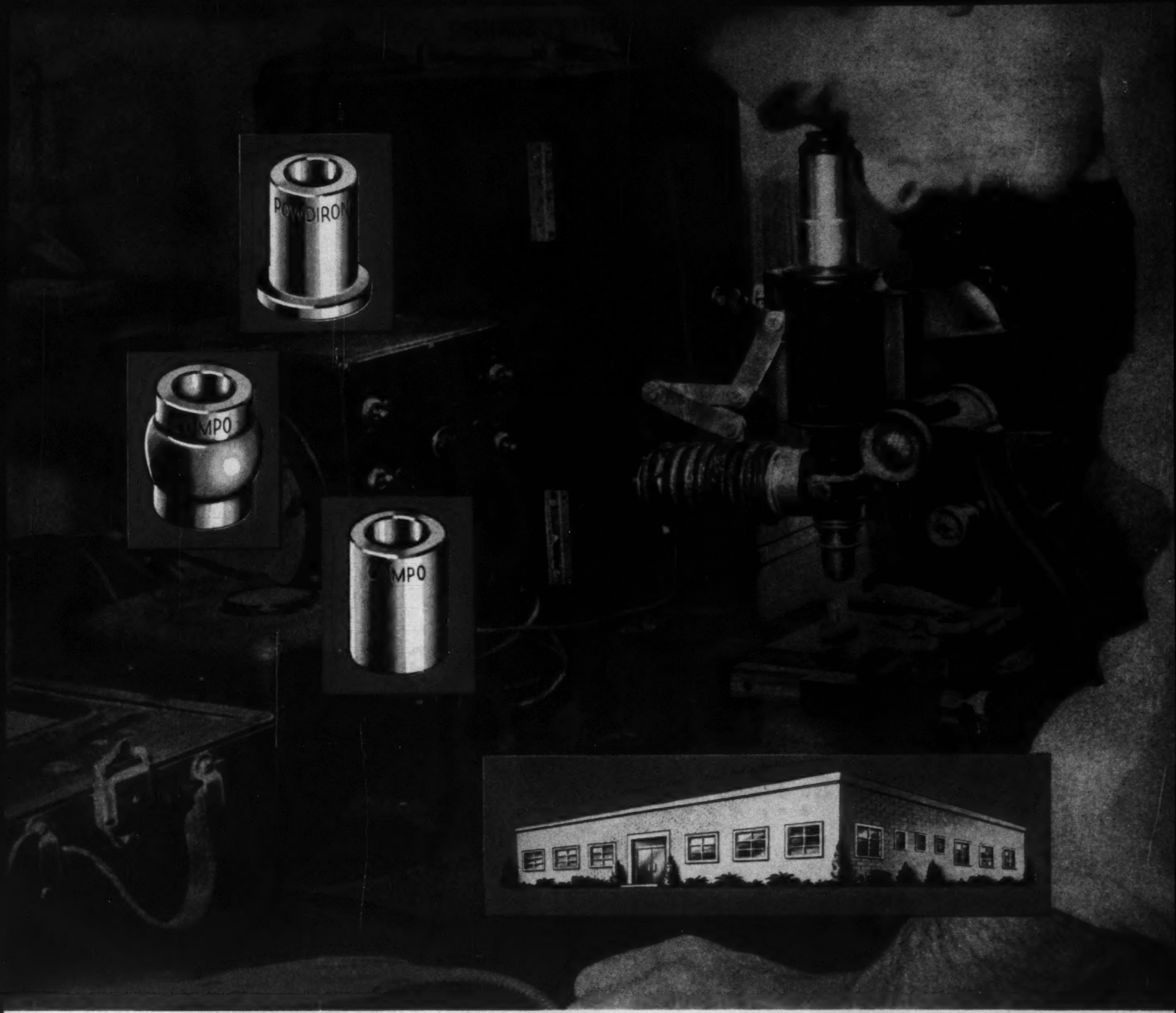
Shears Automatically—There are other types of automatic equipment being designed for steel mills. For example, there's an automatic cropping shear going at the 80-in. hot strip mill at U. S. Steel's Gary plant.

Here's how it'll work. Special detectors will scan the strip and locate the proper spot for cropping. The spot is then synchronized with the speed of the strip. A signal will be sent ahead and the strip is automatically cropped at the right place as it passes the shear.

Reduces Camber — Consider the problem of camber in a strip. If a plate is non-uniform, it may line up crookedly in the mill. A camber in the strip soon results; the scrap rate goes up.

A new system is being designed to detect camber as it is formed. Signals will then be sent to the mill to adjust the screwdown controls which will correct the camber.

A number of other examples can be cited to point up the trend. There's no doubt about it. Automatic controls and computers are proving their worth in steelmaking.



Better bearings begin here in the newly constructed laboratories of Bound Brook's Research and Development Division. Here, with new facilities and modern equipment, Bound Brook's highly specialized talents create new bearing materials, help you develop new product applications. Here, Bound Brook engineers employ unique test equipment to duplicate any conditions, service-test your bearings before they're put in production. If you want to turn your problems into new ideas, new designs, new bearing applications . . . turn to Bound Brook!

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Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
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Plants at Bound Brook, N.J. and Sturgis, Mich.

IF you want to HEAT metal . . . .

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exotic . . . . whether your parts travel

one at a time in batches

or in droves

in a straight air atmosphere . . . . or

in a protective atmosphere

or an upgrading atmosphere

in & out . . . down & up

straight through

or in a combination

with manual operation

or automatic AND if you want

the economy of standard equipment

the least costly fuels . . .

PLUS known production rates and

pre-rated operating costs

WHAT DO YOU NEED? (pit, pot, box,

link, muffle, tube, snap or lab furnace)

. . . SURFACE MAKES IT!

Write for Bulletin SC-175. Surface Combustion, 2373 Dorr St., Toledo 1, Ohio.
In Canada: Surface Industrial Furnaces Ltd., Toronto, Ontario.
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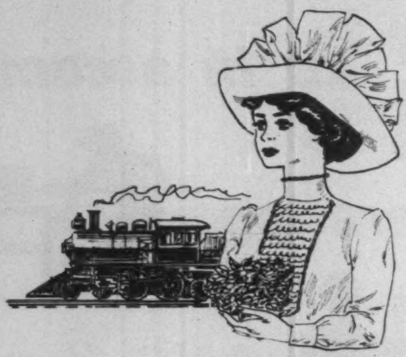
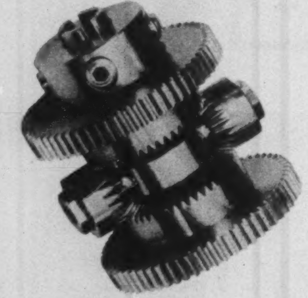
Surface®

CLEAN AS PHOEBE SNOW ?



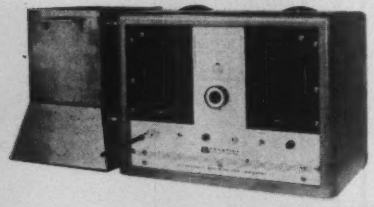
NO . . .

CLEAN AS A DIFFERENTIAL!



Phoebe Snow (of Buffalo) was the spotless-white symbol of cleanliness in the 90's, when the Lackawanna Railroad was selling train travel. Today, she wouldn't quite fill the bill; this ultrasonically cleaned high-precision differential comes closer to space-age standards.

In just 15 to 30 seconds, with the unit completely assembled, an Acoustica Ultrasonic Cleaner—50-watt pulsing generator, ultrasonic transducer, 1½-gallon tank—literally but safely blasts away every trace of dirt, from even the most minute cracks, hidden surfaces and blind holes. Oil, dust, metal chips, lapping compound, even soils invisible to the eye are removed from gears, shafts and bearings. Acoustica equipment has not only drastically cut cleaning time but has substantially improved reliability in the bargain.



Acoustica Model DR250: 500 watt generator, 5 gallon tank. Throughout the precision metal-working industries, such ultrasonic cleaners—with capacities up to 75 gallons available—are sending costs sharply down, quality sharply up.

FOR COMPLETE EQUIPMENT DESCRIPTIONS AND AN ANALYSIS OF **YOUR** CLEANING PROBLEMS, WRITE TO ACOUSTICA OR CONTACT YOUR NEAREST ACOUSTICA REPRESENTATIVE.

acoustica

ACOUSTICA ASSOCIATES, INC.
10400 Aviation Blvd., Los Angeles 45, Calif. • 600 Old Country Road, Garden City, N.Y.

New Patents In Metalworking

From Powder to Sheets

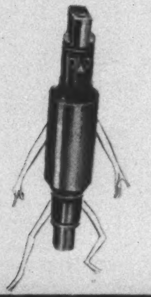
Process of preparing iron powder capable of being rolled directly to sheet form, I. P. Whitehouse and W. A. Reed (assigned to Republic Steel Corp., Cleveland), Aug. 2, 1960. In a method for preparing metallic iron powder, magnetite or similar ore is ground to 200 mesh. It is then subjected to two-stage hydrogen reduction in a fluidized bed, under optimum conditions of temperature and pressure. This powder is suitable for direct fabrication into sheets. No. 2,947,620.

Recovers Nickel

Treatment of alloys containing iron group metals, S. M. Shelton (assigned to Oregon Metallurgical Corp., Albany, Ore.), July 26, 1960. In a method of recovering nickel or cobalt from alloy scrap containing those metals, the scrap is melted with an optimum proportion of aluminum. This forms an intermetallic compound which is readily amenable to grinding and subsequent dissolution in acid. No. 2,946,677.

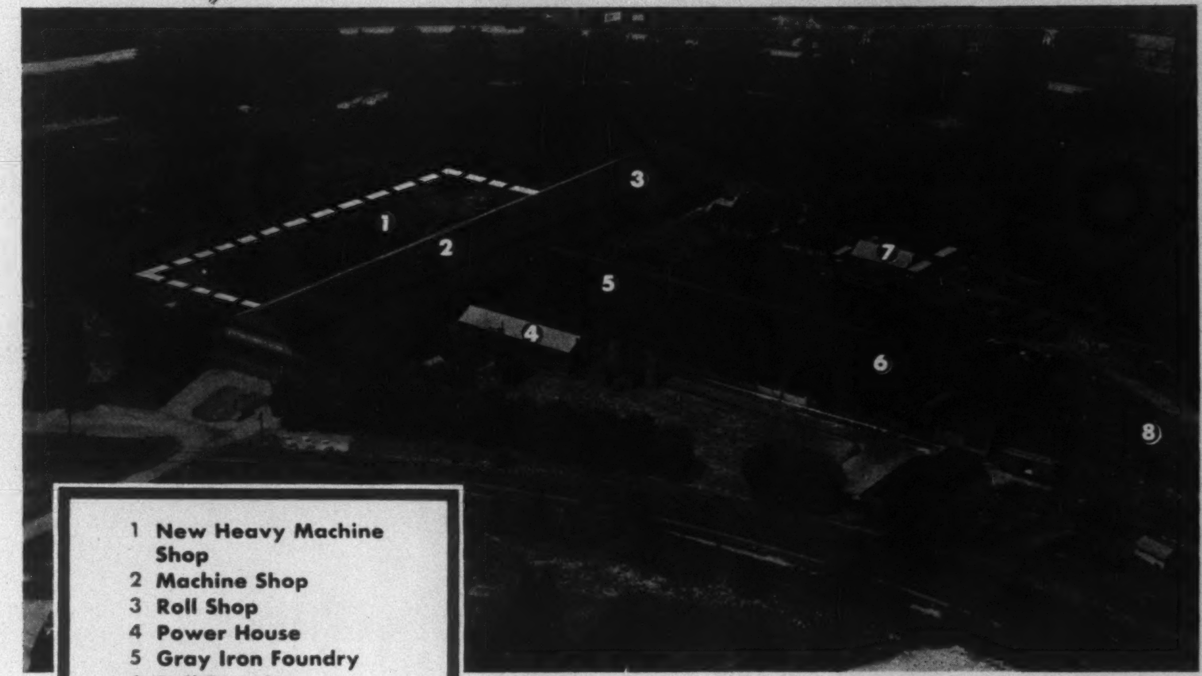
As-Cast Malleable Iron

Boron-containing ferrous metal having as-cast compacted graphite, P. R. White, R. F. Thomson and C. F. Joseph (assigned to General Motors Corp., Detroit), July 5, 1960. Method of making an as-cast malleable iron having high tensile strength and modulus of elasticity. It comprises 1-2.5 pct C, 1.5-3.2 pct Si, up to 0.02 pct Te or Bi, 0.001-0.05 pct predominantly acid-insoluble B, and the remainder Fe. No. 2,943,932.



Hyde Park

Adds Facilities for LARGER and HEAVIER STEEL MILL EQUIPMENT



1 **New Heavy Machine Shop**
2 **Machine Shop**
3 **Roll Shop**
4 **Power House**
5 **Gray Iron Foundry**
6 **Roll Foundry**
7 **Pattern Storage**
8 **Scrap Yard**

ROLLS

Nickel Alloy Grain Rolls
Grain Rolls
Chilled Rolls
Nickel Chilled Rolls
Moly Rolls
Nodular Iron Rolls

All Grades Nickel Alloy Iron Rolls for Hot and Cold Rolling

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Merchant Mills
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Stretcher Levellers
Sheet Mill Shears
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Sheet and Strip Mills
Pinion Stands
Reduction Drives
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Machine Work

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Furnace Castings
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Machinery Castings
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Heavy Tool Castings
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A new Heavy Machine Shop Building with 27,000 square feet is being built to augment erection and heavy tool facilities.

The main bay will have a 60 foot center aisle with capacity for 75 Ton Cranes.

Now, with expanded erection and engineering facilities, Hyde Park welcomes the opportunity to work with you on any of your equipment requirements.

SEE US AT THE Iron & Steel EXPOSITION SEPT. 27, 28, 29, 30 CLEVELAND, OHIO

Booth 470

Hyde Park

RED CIRCLE Rolls ALLOY-CHILLED

The Mark of Quality

Foundry and Machine Company

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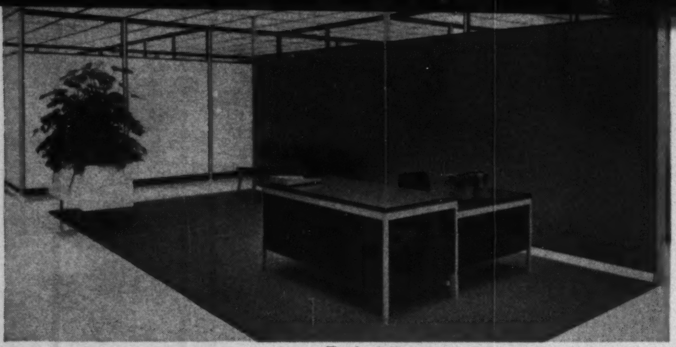

Typical Hauserman interior wall installation.

The E. F. HAUSERMAN COMPANY

Gets Dead Flat Sheet Steel with VOSS Roller Levelers

...and saves time and money doing it!

Hauserman standards are *tough*. Every sheet of steel used in a Hauserman movable interior wall is inspected on a slate table for absolute flatness. Before Voss levelers were installed, the company used stretcher-leveled sheets . . . and still had to reject 33% as not meeting their severe specifications. Now steel is ordered in coils, and Voss-leveled on their own processing line. Rejects are consistently held under 5%, and the company gains the economy and flexibility of handling steel in coil form. Voss levelers have operated at Hauserman for 10 trouble-free years. They help the company maintain the most rigid quality standards in the movable partition industry.

Voss levelers are currently at work in plants of many primary steel and aluminum producers and major fabricators. Applications include high speed galvanizing lines, hot and cold rolled shear lines, steel plate, aluminum sheets and coils, and others. Let Voss put its experience to work on your leveling problems.

VOSS ENGINEERING CO.

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STEELMAKING AT JESSOP

Experience counts . . . and Jessop has it

There is no substitute for experience in making steel for the reactors of nuclear submarines like the Nautilus, the Skate and the Polaris-firing George Washington. Jessop's activity in nucleonics dates back to the early days of the Manhattan Project.

Today, Jessop's still at it—continuing research, improving techniques, piling up experience in making sophisticated steels to harness the atom. And Jessop is out front in other steelmaking fields too.

Whether you use heat- or corrosion-resistant stainless steels; abrasion- or shock-resistant steels; non-magnetic or precision ground steels; high speed, cast-to-shape, clad or alloy steels, you can be sure of the quality—and *service*—you'll get when you do business with Jessop.

In quality steelmaking experience counts, and Jessop has it. Call a Jessop sales office in any of 23 major cities of North America and discuss *your* needs for specialty and alloy steels.

Jessop Steel Company
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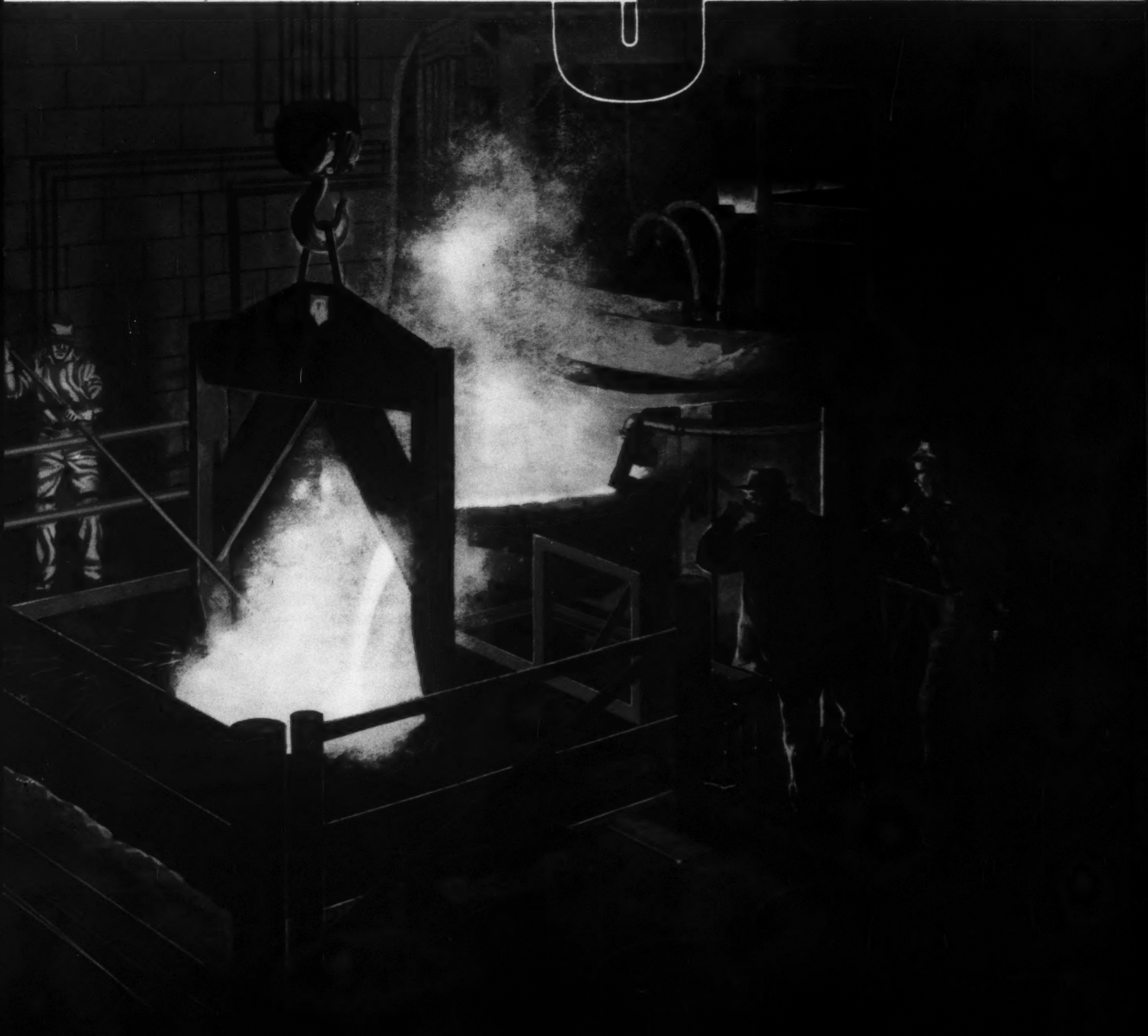
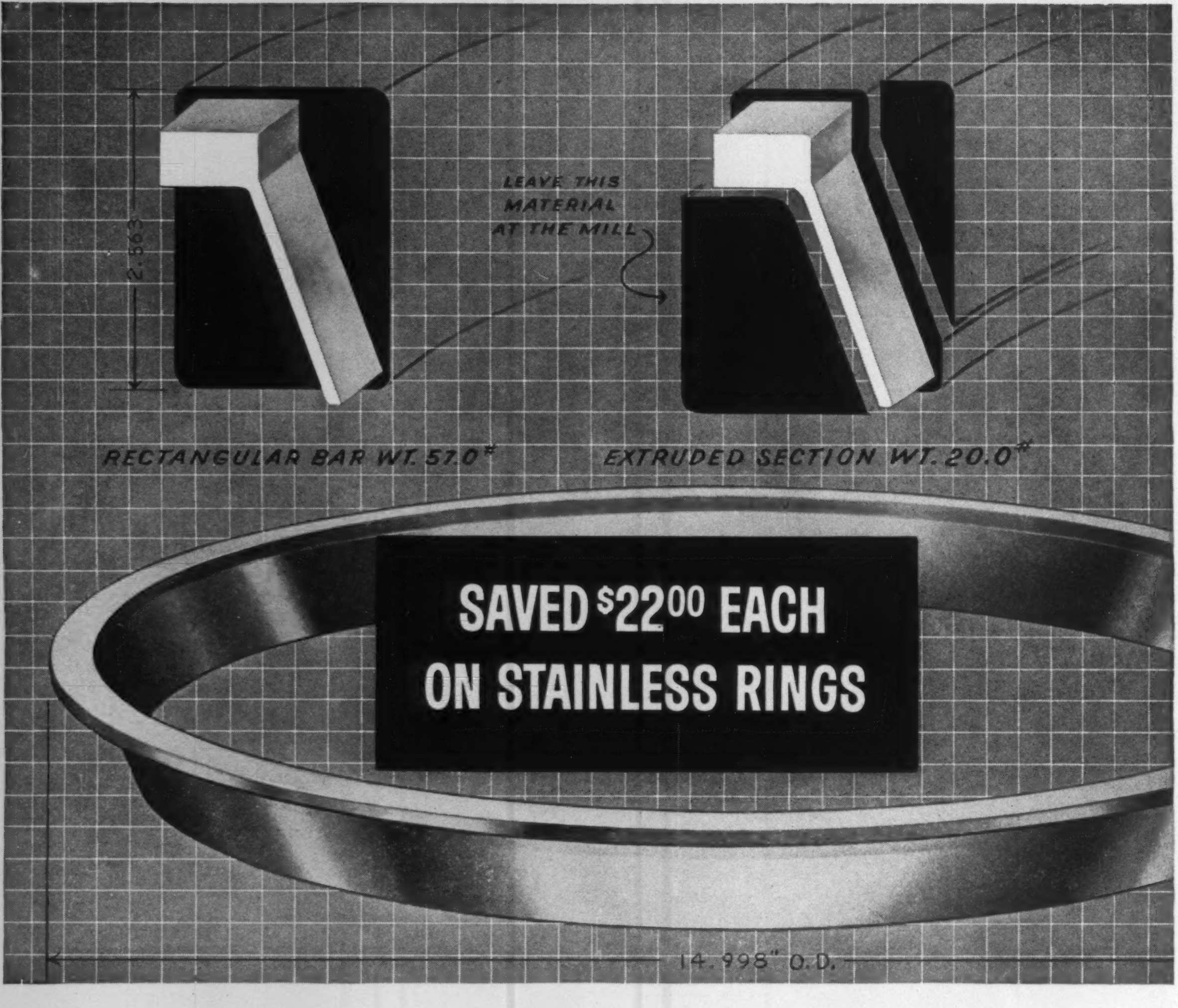
JESSOP




LEAVE THIS MATERIAL AT THE MILL
2.563
RECTANGULAR BAR WT. 57.0#
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SAVED $22.00 EACH ON STAINLESS RINGS
14.998" O.D.

Flash butt-welding an extruded section resulted in a 65% material reduction

By specifying an extrusion that allowed only a thin envelope of material around the finished cross-section, Amweld engineers saved 37 lbs. of 321 stainless—and eliminated considerable machining time. Amweld flash butt-welding know-how produced a ring that more than satisfied the critical strength requirements for this jet engine shroud.

Amweld is equipped to supply flash butt-welded rings and circular products in stainless, titanium, aluminum, as well as a wide variety of corrosion-resistant alloys. If you would like to know more about Amweld's welding, fabricating and machining facilities, phone or write.

GET THE FACTS ABOUT AMWELD

New 20-page catalog describes flash butt-welded rings and circular products manufactured by Amweld. Also booklet entitled, "How Flash Butt-Welded Rings are Made."

AMWELD® INDUSTRIAL PRODUCTS

THE AMERICAN WELDING & MFG. CO. • 120 DIETZ ROAD • WARREN, OHIO

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Portable Sand Blaster

A two-page brochure, on a rugged and powerful sand blaster, outlines complete specifications on the sand blaster. The unit has finger-tip control and twice the blasting power available in previous models. (ALC Co.)

For free copy circle No. 1 on postcard

Socket Cap Screws

Latest information on a series of socket head cap screws is detailed in a colorful brochure. The brochure contains complete dimensional data. (Standard Fasteners)

For free copy circle No. 2 on postcard

Boring, Reaming Tools

A technical-information supplement features illustrations, diagrams and detailed instructions on the use of adjustable boring and reaming tools. (Muskegon Tool Industries, Inc.)

For free copy circle No. 3 on postcard

Metalforming

A brief bulletin explains hot extrusion and die forging. It gives their advantages. Also included is a list of copper alloys that the company can extrude or die forge. (Janney Cylinder Co.)

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Production Machines

Precision production machines, for contour and conventional grinding, boring and turning, are described in a four-page bulletin. The bulletin describes the custom designing service that provides vertical machines in many configurations, to meet customer requirements, using building block construction. (The Kaydon Engineering Corp.)

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Automatic Assembly

Described in an eight-page catalog is a new approach to automatic assembly. Featured is a standard rotary transfer machine which includes parts placing motions at the working area on the dial. (Ferguson Machine Corp.)

For free copy circle No. 6 on postcard

Strapping System

A booklet describes a company's entire line of heavy-duty and tensional strapping; tools, accessories and seals. It contains application and specification data. (Sharon Steel Corp.)

For free copy circle No. 7 on postcard

Better Metalworking

Pocket-size, a brochure tells how to select cleaners, cutting lubricants, drawing compounds, rust preventives, forging compounds, and extrusion lubricants. It lists 46 different compounds in the above categories to simplify selection by pin-pointing to specific applications. This selector includes compounds for all types of metal and processing conditions. (Macco Products Co.)

For free copy circle No. 8 on postcard

Steel Castings

Precision steel castings, produced in ceramic molds, are dealt with in a bulletin. It describes the relative advantages of process and illustrates examples and applications. (Lebanon Steel Foundry)

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Silicones

Colorful and well illustrated, a brochure's subject matter is silicones for the automotive industry. The eight-page reference describes

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how silicones, in various physical forms, are helping designers of autos, trucks and other land vehicles solve some of their most difficult engineering problems. Applications for silicone products in production equipment, and as aids to manufacturing and maintenance, are also outlined. (Dow Corning Corp.)

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Rotary Table Feeders

Rotary table feeders are described in an eight-page bulletin. The rotary feeders are designed for controlled feeding of sand, crushed ore, wood chips and similar bulk materials. The feeders provide an efficient method of metering material from vertical storage bins. (Chain Belt Co.)

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Washable Tracings

A completely new process of restoring the printability of original tracings, simply by washing them with soap and water, is described in a four-page bulletin. Included with the bulletin is a free sample of washable drafting film plus a free pencil, which puts down a waterproof plastic line. The reader can thus make the dramatic wash-test for himself (Keuffel & Esser Co.)

For free copy circle No. 12 on postcard

Linear Control Systems

Illustrated with photos, a bulletin describes analog linear control systems. The systems are designed to automatically control the point-to-point positioning of machine tools. (Modern Div. of United Aircraft Corp.)

For free copy circle No. 13 on postcard

Live Storage

Photographs, drawings and diagrams explain principles, operation and installations of rack for live storage, in an eight-page bulletin. Six advantages of flow rack live storage are discussed in the bulletin. (The Rapids-Standard Co., Inc.)

For free copy circle No. 14 on postcard

Remote-Control Devices

Light-duty flexible shafts and flexible shaft couplings are illustrated in a catalog. The 12-page catalog lists in detail, many types and sizes of standard flexible shafts and couplings ready for installation; also the more popular component parts such as end fittings, core sizes and casings required to design special assemblies. (Kupfrian Mfg. Corp.)

For free copy circle No. 15 on postcard

Fusion Welding

Company developments in highly-precise, fully-automatic fusion-welding equipment are covered in a pictorial report. Featured within this 27-page report are actual applications where subject equipment has been in use for the past two years. Equipment descriptions are also contained. (Sciaky Bros., Inc.)

For free copy circle No. 16 on postcard

General-Purpose Seals

Consisting of eight-pages, a folder describes and illustrates two designs in general-purpose mechanical shaft seals. The folder shows cutaway views of the seals and includes a list of minimum mounting dimensions; as well as a list of recommended seal materials for various mediums. (Muskegon Piston Ring Co.)

For free copy circle No. 17 on postcard

Ball Bearings

A data sheet gives complete dimensional and performance specifications for miniature extended inner-ring ball bearings. Extended inner-ring bearings are particularly useful where it is desirable to eliminate spacers or controlled shoulders on shafts. (Miniature Precision Bearings, Inc.)

For free copy circle No. 18 on postcard

Gear-Shaving Machines

Pictured and described in an eight-page bulletin are features of a line of gear finishers. The bulletin covers the three methods of shaving that can be used: underpass, transverse and modified underpass. It also shows how setup procedures are simplified. (Michigan Tool Co.)

For free copy circle No. 19 on postcard

Cements and Mortars

Cements and mortars are the subjects in a new bulletin. Featured are the company's super-duty brand of refractory cements, both wet and dry; also, mortar which is a heat setting product, for application wherever the penetration of slags and molten iron and steel is a problem in the life and efficiency of refractory linings. (Walsh Refractories Corp.)

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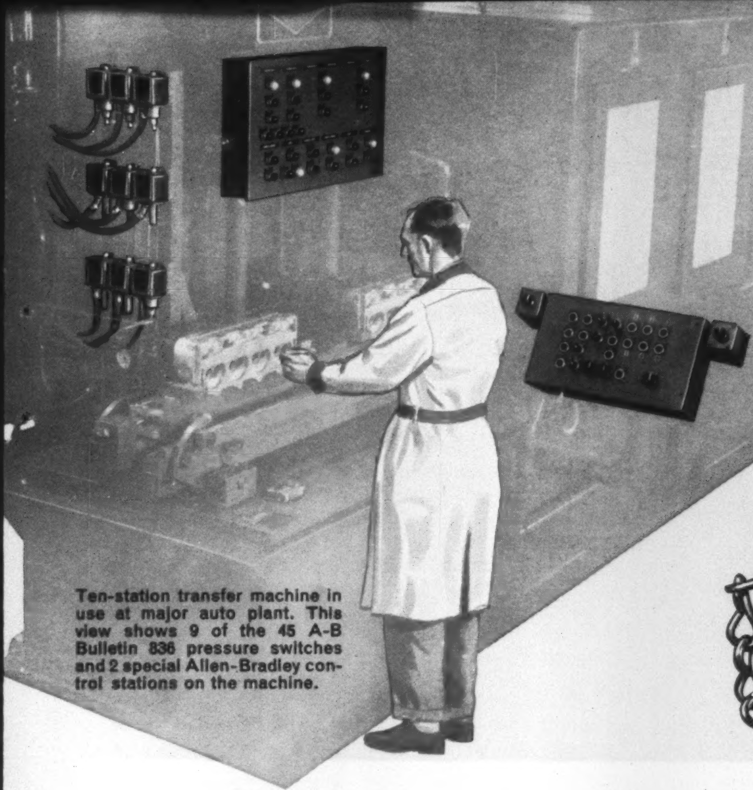
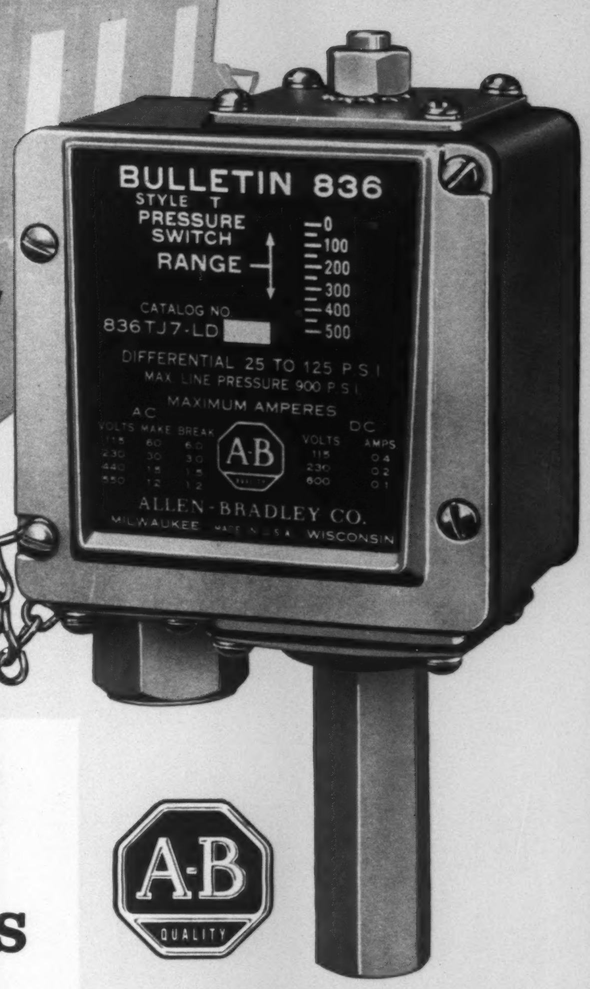


Ten-station transfer machine in use at major auto plant. This view shows 9 of the 45 A-B Bulletin 836 pressure switches and 2 special Allen-Bradley control stations on the machine.


BULLETIN 836
STYLE T
PRESSURE SWITCH
RANGE
0
100
200
300
400
500
CATALOG NO.
836TJ7-LD
DIFFERENTIAL 25 TO 125 P.S.I.
MAX. LINE PRESSURE 900 P.S.I.
MAXIMUM AMPERES
AC
DC
A-B
ALLEN-BRADLEY CO.
MILWAUKEE MADE IN U.S.A. WISCONSIN

Bulletin 836 Style T Oiltight Pressure Switch

ALLEN-BRADLEY

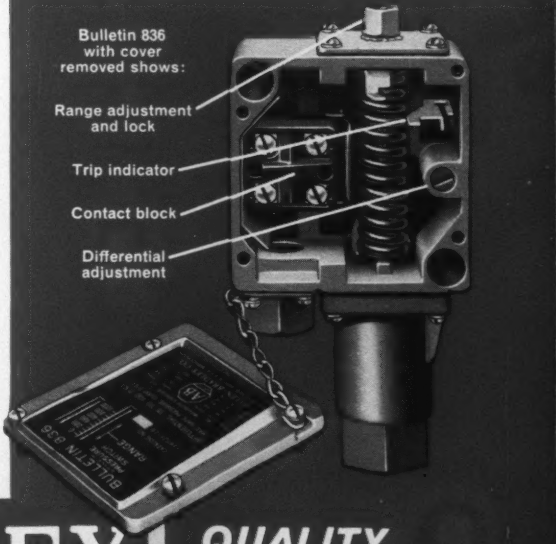
OILTIGHT

Pressure Switches

provide consistent accuracy and maximum reliability

These rugged Allen-Bradley Bulletin 836 Style T oiltight pressure switches are specifically designed to take the punishment of hard, day-in and day-out industrial use. The die-cast aluminum housing is completely sealed. Oil cannot get in and foul the contacts—even when it flows over the enclosure in a continuous stream. The precision switch mechanism insures extreme accuracy of repeatability. An extremely important feature lies in the "snap action" of this switch—it maintains its normal contact pressure up to the instant of switchover—regardless of how slowly the trip point is approached. Contact chatter—which means unreliable operation—is impossible, and contact life is greatly increased. The contact block has two isolated circuits with one N.O. and one N.C. set of contacts.

Both the operating pressure and the differential are adjustable. The pressure is externally adjustable with the setting shown on a calibrated scale, and a trip indicator shows the operating point. These A-B *quality* controls are made for operating at pressures up to 5000 psi. Write for full details.



Bulletin 836 with cover removed shows:

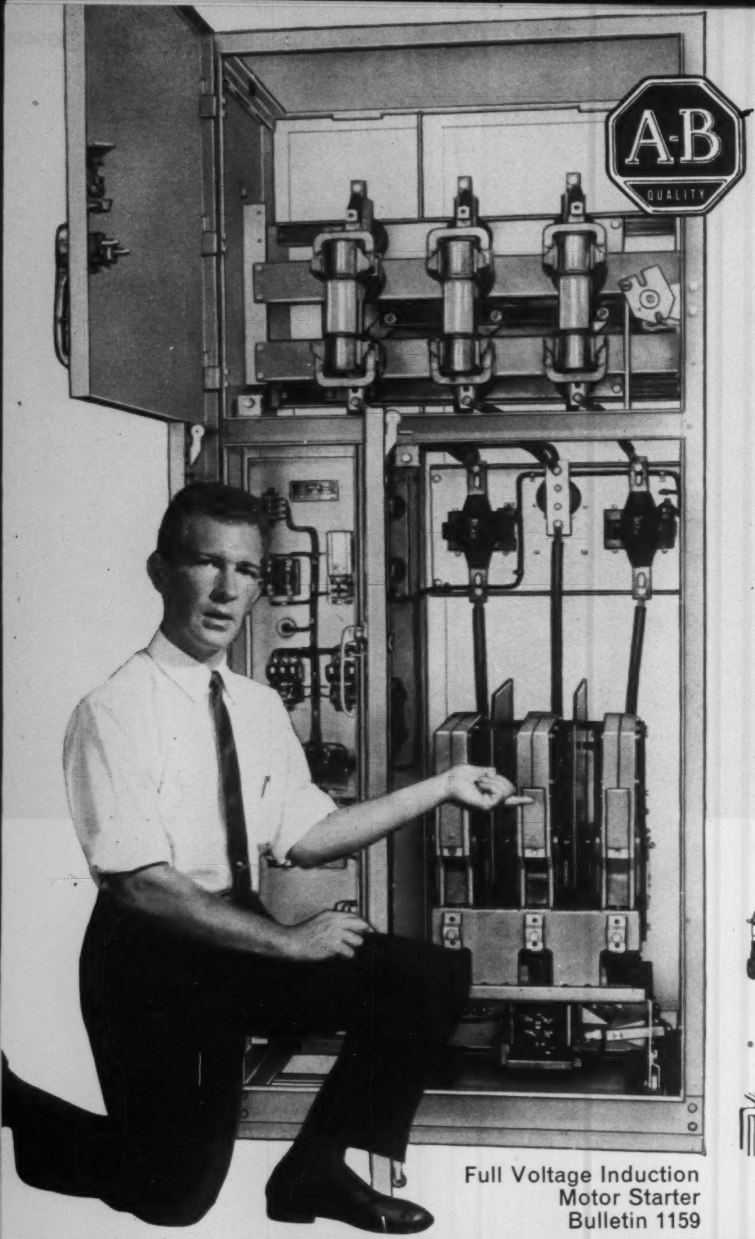
Range adjustment and lock
Trip indicator
Contact block
Differential adjustment
BULLETIN 836

ALLEN-BRADLEY

Member of NEMA

QUALITY MOTOR CONTROL

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis. • In Canada: Allen-Bradley Canada Ltd., Galt, Ontario



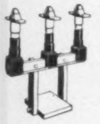
Full Voltage Induction
Motor Starter
Bulletin 1159

The only
HIGH VOLTAGE STARTERS

built to provide millions of trouble free operations

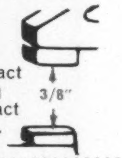
An astounding claim but true! The secret of this remarkable operating life of Allen-Bradley high voltage air break starters is found in the extremely short contact travel—*it's only ⅜"*. Thus, pounding and contact wear are reduced to a minimum. In addition, contactors in A-B high voltage starters have only ONE moving part. It's the same simple solenoid design that has proved good for millions of trouble free operations in A-B low voltage starters. And like A-B low voltage starters, the double break, silver alloy contacts never need maintenance. For complete details on Allen-Bradley high voltage starters, send for Publication 6080.

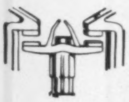
FEATURES OF THE ALLEN-BRADLEY RUGGED SOLENOID AIR BREAK CONTACTOR



ONE MOVING PART
All trouble-causing pivots, pins, and flexible jumpers are eliminated.

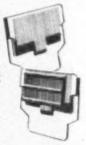
CONTACT TRAVEL ONLY 3/8"
Reduced impact and pounding extends contact operating life.



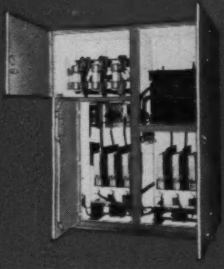


DOUBLE BREAK CONTACTS
of silver alloy completely eliminate the need for contact maintenance.

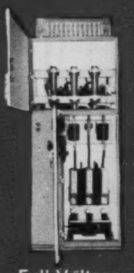
FAST ARC SUPPRESSION
New blowout design, new arc chutes molded of arc resistant material.



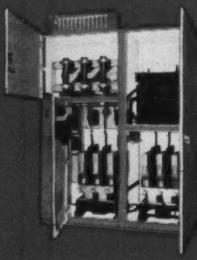
ALLEN-BRADLEY HIGH VOLTAGE STARTERS ARE MADE FOR ALL TYPES OF MOTORS AND ALL TYPES OF SERVICE



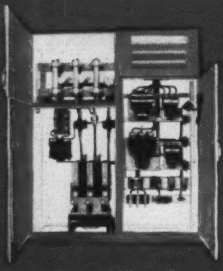
Reduced Voltage
Induction Motor Starter
Bulletin 1172



Full Voltage
Synchronous Motor Starter
Bulletin 966



Reduced Voltage
Synchronous Motor Starter
Bulletin 983



Wound Rotor Motor Starter
Bulletin 1180

ALLEN-BRADLEY

Member of NEMA

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis. • In Canada: Allen-Bradley Canada Ltd., Galt, Ontario

**QUALITY
MOTOR
CONTROL**

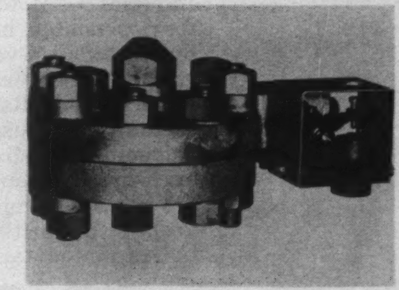
12-60-MR

New Materials and Components

Pilot Valve Operates on Liquid-Level Difference

Variable system pressures do not affect the function of an unusual differential-level pilot valve. The valve operates on the difference between two columns of liquid; usually between a constant reference head and a variable head. As the level rises in the variable column, the differential level pilot valve opens and releases air pressure from the top of a diaphragm motor valve. This allows the discharge of liquid from the variable column. When the level in this column falls to a pre-determined level, the valve again closes, and the cycle repeats. (Besler Corp.)

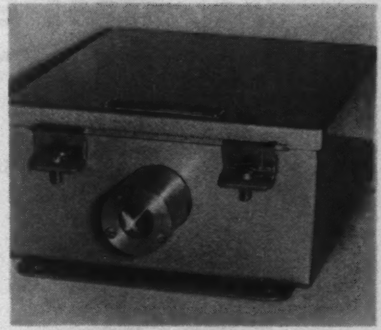
For more data circle No. 22 on postcard, p. 177



Relay/Detector Responds to Moving Hot Objects

Sensing the presence of any moving hot object, an infra-red detector relay starts, stops or adjusts any relay-controlled equipment associated with the process. A high degree of built-in reliability insures positive action under the most adverse operating conditions of high ambient light levels; dust and steam atmospheres; wide temperature fluctuations and input overloads. The device does not see a hot background—only the higher temperature material moving through. It is drift free and insensitive to the wide variations in temperature encountered in furnace and hot mill areas. (The Electron-Machine Corp.)

For more data circle No. 23 on postcard, p. 177



Motor Starters' Parts are Removable From Front

Offering unitized construction, magnetic motor starters occupy small mounting area with no reduction in wiring room. Features include: plug-in type push buttons or selector switches, easily added in the field; thermal overload relays with trip indicator are trip free and tamper proof; coil has molded terminal board eliminating leads. Other features are: low-wattage magnet, silver-cadmium oxide contacts, pressure terminals, and fungus-resistant coil. The magnet coils are molded type dual-voltage (110/-220 or 220/440) dual cycle (50 or 60). Up to three auxiliary interlocks for pilot duty may be added. (Furnas Electric Co.)

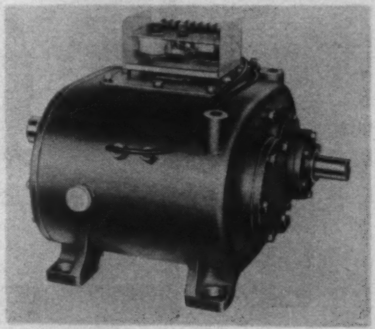
For more data circle No. 24 on postcard, p. 177

FURNAS
ELECTRIC

Transmissions Offer Speed Changes under Power

Transmissions with electro-magnetic clutches are especially adaptable for automatic machinery where transmission is unaccessible to the operator. Without interrupting power source, the transmissions provide speed changes and reversing under power. With two to eight speeds, the units have capacities from 52-750 ft-lb, and a wide ratio selection (up to 10:1). Electric switches, tape, cam or other remote-control means available accomplish manual or automatic control of speed changes. Electric transmissions of this type find a broad application on machine tools (universal and special purpose). (Western Mfg. Co.)

For more data circle No. 25 on postcard, p. 177

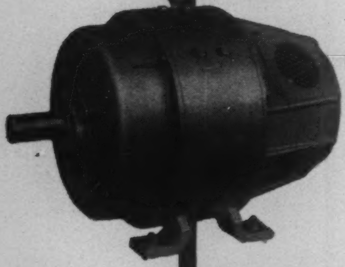


IMPERIAL D-C MOTORS

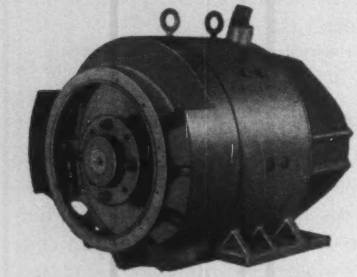
for Dependable Heavy-Duty Service

Imperial D-c Motors meet the ever-increasing demand for dependable, heavy-duty drives in nearly every industry today. Over seventy years of d-c design and application experience is behind the manufacture of these motors. Ratings from 1 through 125 hp., for constant or adjustable speeds with shunt, series or compound windings are available in all standard enclosures. When you choose *The Imperial Line* you are assured of motors that stay on the job longer . . . keeping production high at lower costs. Write for bulletin or contact the sales office nearest you.

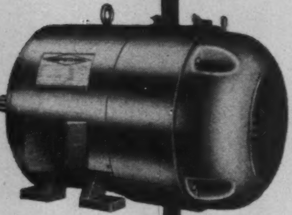
IMPERIAL
ELECTRIC COMPANY
84 Ira Ave. • Akron 9, Ohio



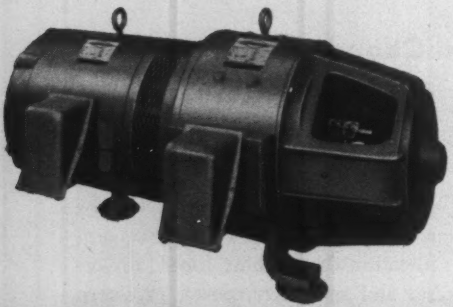
Semi-Guarded D-C Motor



Drip-Proof D-C Generator, SAE Flange Mounting



Totally-Enclosed Fan-Cooled D-C Motor



Two-Bearing Motor-Generator Set

DESIGN DIGEST

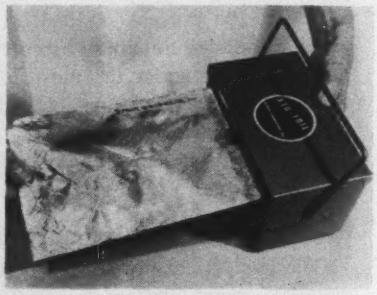
Ball Bearing

Operating at temperatures up to 575°F, without conventional lubrication, a ball bearing fills the needs of newer types of synchros, motors, blowers and fans that operate at far higher temperatures than their predecessors. The bearing can operate in air, most gases and liquids, and vacuums. (The Barden Corp.)

For more data circle No. 26 on postcard, p. 177

Nip and Crown Check

Six-inch wide rolls of specially-designed and embossed aluminium foil, test both the nips and crowns of rubber-covered rolls. A strip of foil is pulled from the dispenser and placed across the face of the rubber roll to be checked. Pressure-sensitive tape fastens the foil in place. Reduced pressure is applied to engage the rolls and bring both ends into contact evenly. As the pressure is increased, the foil is pressed flat in the nip. In effect, a picture is taken of the nip contact area. The sensitivity of the foil pattern provides a sharp, clear impression which permits measurements to within one hundredth of an inch. (Stowe-Woodward, Inc.)



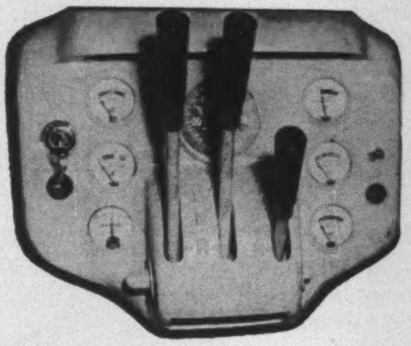
For more data circle No. 27 on postcard, p. 177

Self-Cleaning Filters

Self - cleaning, edge - type filters are all-metal units which permit positive filtration of fluids without interruption of flow. They are continuously cleanable with manual or motor drive. The filters require no cartridge replacement. They handle large volumes of fluid at low pressures in a filter housing about one-

YOU PAY EVERY TIME YOUR OPERATOR PUSHES THE CLUTCH !

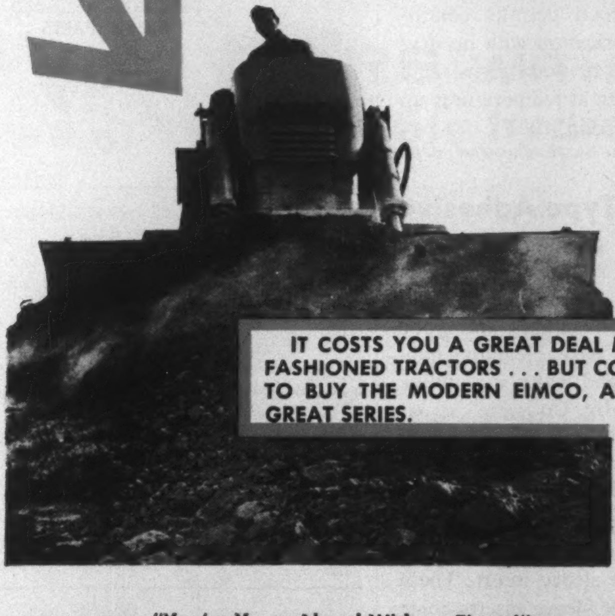
Here's another SAVING WITH the modern automatic EIMCO®



When you buy an Eimco crawler tractor unit, you get as standard equipment and at no extra cost, the money-saving, work-increasing plus of heavy industrial type single-stage Torque Converter teamed with Eimco's exclusive "Unidrive" transmission and Dual Final Drives.

What does this mean to you in dollars and cents? Check your cost sheets! With old fashioned clutch operated tractors, you'll find such entries as frequent overhauls on overtaxed engines at $1,200 to $1,500 each time . . . engine disconnect-clutch replacements at $800 or more annually, plus expensive downtime . . . constant bills for repairs of shock-load damaged axles and drive lines . . . and some major equipment damage repair everytime you train an operator.

You can greatly cut . . . or completely eliminate . . . these costs with the modern Eimco tractor. No clutch repairs. No shock-load damage. Simple flip-of-the-lever controls makes it nearly impossible for even a rookie operator to cause damage to the rugged Eimco. And you should save at least one engine overhaul out of three, as the Eimco power-train cushions load and speed shocks . . . assures irresistable push or pull . . . more work-ability



IT COSTS YOU A GREAT DEAL MORE TO RUN OLD-FASHIONED TRACTORS . . . BUT COSTS YOU NO MORE TO BUY THE MODERN EIMCO, AVAILABLE IN THREE GREAT SERIES.

The Eimco 103	The Eimco 105	The Eimco 106
100 HP Diesel	143 HP Diesel	205 HP Diesel

TRACTOR • BULLDOZERS • EXCAVATORS • FRONT END LOADERS • LOG LOADERS • STEEL MILL FRONT END LOADERS AND EXCAVATORS

B-590

"You're Years Ahead With an Eimco!"

THE EIMCO CORPORATION

TRACTOR LOADER DIVISION

634 SOUTH 4TH WEST
SALT LAKE CITY, UTAH — U.S.A.

EXPORT OFFICE: 51 - 52 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

fifth the size required for use with disposable filter cartridges. Typical uses in the metal working area include the protection of machine tools from damage to vital bearing areas. (The Cuno Engineering Corp.)

For more data circle No. 28 on postcard, p. 177

Tube Fitting

For corrosion-resistant service, a tube fitting has all three parts machined from type 316 stainless steel barstock or forgings. The fitting is compatible with any fluid for which type 316 stainless steel tubing is used. The fitting features easy assembly. (Parker-Hannifin Corp.)

For more data circle No. 29 on postcard, p. 177

Industrial Insulation

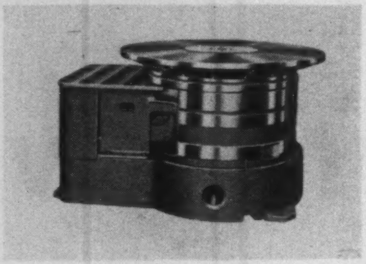
Spun mineral-wool felts come in a broad range of densities, for many industrial, commercial and building applications where temperatures are under 450°F. The mineral wool fibers of these products are spun, felted, uniformly distributed and securely bonded together to guarantee maximum thermal efficiency.

Being chemically stable and water repellent, the mineral wool fibers in the felts simply do not disintegrate even when exposed to severe service conditions. In heavier densities, the felts have superior structural strength for products of this type. (The Eagle-Picher Co.)

For more data circle No. 30 on postcard, p. 177

Indexing Chassis

A heavy-duty, turret indexing machine chassis provides intermittent motion for multiple-station automatic assembly operations. The chassis is a complete packaged chassis including motor, drive and clutch. It is intended as a basic unit around which special automatic machines can be designed and built. A wide selection of speeds, turret diameters and index positions make the unit readily adaptable to a broad group of automatic assembly and processing operations. (Swanson-Erie Corp.)



For more data circle No. 31 on postcard, p. 177

Plaster Tooling

A new material and method produces short run, low-cost plastic-faced plaster tooling in two hours or less. The simple four-step procedure utilizes a new surface-coat compound, which permits continuous rapid fabrication with no drying or waiting between steps. End tool will operate at temperatures up to 385°F. (Rezolin, Inc.)

For more data circle No. 32 on postcard, p. 177

Emulsion-Type Adhesive

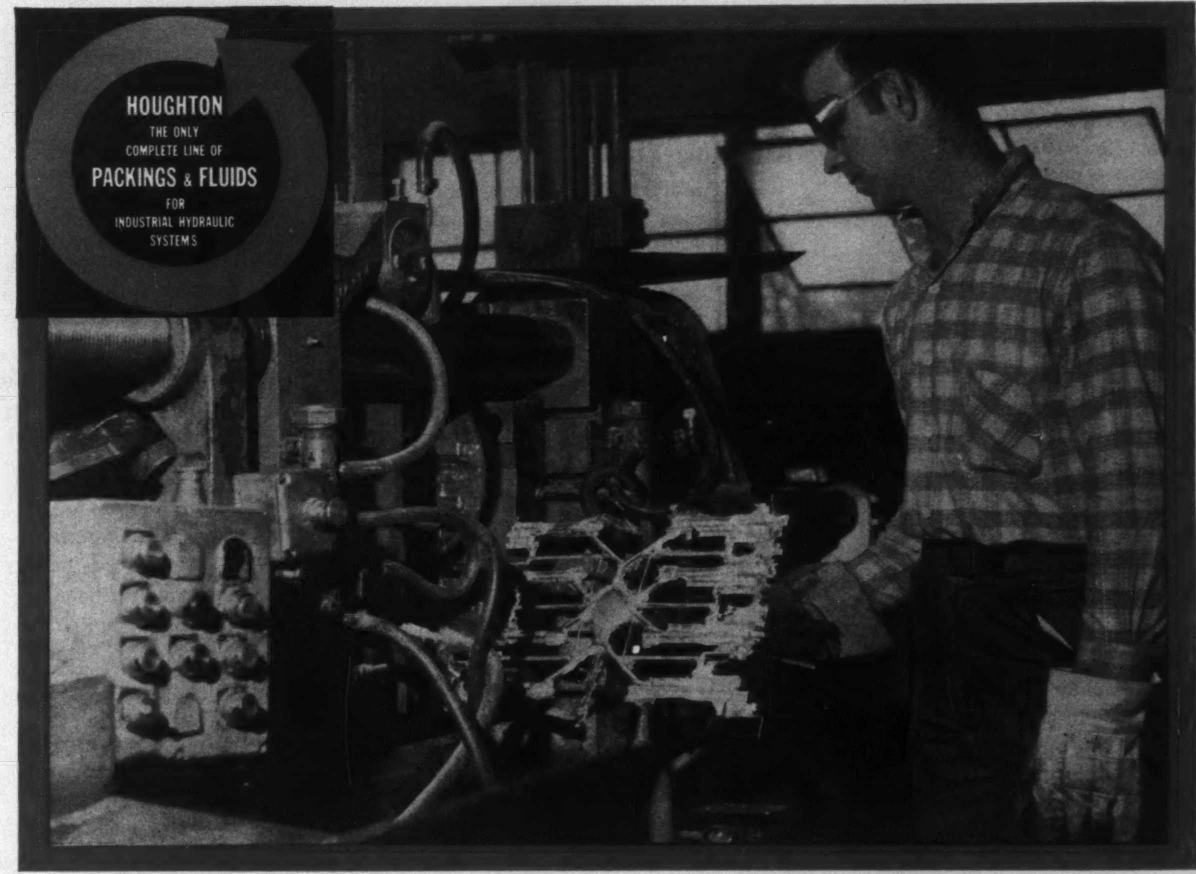
Possessing good heat-resistant properties, an adhesive has all the advantages of an emulsion-type adhesive. The advantages are: good machinability, easy cleanup, nonflammability, and water miscibility. (The Arabol Mfg. Co.)

For more data circle No. 33 on postcard, p. 177

Thread Replacement

Thread replacement without drilling is possible with a self-locking replaceable-sleeve insert. These new replaceable sleeve inserts come as one-piece assemblies. This way, they are easy to handle at installation without fumbling for small accessory parts. They may be screwed by hand into tapped holes prepared with standard drills and taps. Ex-

THE
H
"V" PACKINGS
O
"O" RINGS
U
CUP PACKINGS
G
ROD & SHEET PACKINGS
H
PRECISION MOULDED RUBBER PARTS
T
FIRE-RESISTANT HYDRAULIC FLUID
O
HYDRAULIC FLUIDS
N
ON-THE-JOB SERVICE
LINE



SIX YEARS WITHOUT DRAINING . . .
a lesson in safe hydraulic fluid economy

Since 1954, four 400-ton die casting machines like this one operated continuously on *their initial fill* of Houghto-Safe Hydraulic Fluids. Only make-up was needed to maintain proper fluid level. And each machine operated more than 3000 hours every year.

What better example of the important *extras* you get in *fortified* Houghton Fire Resistant Fluids? In addition to fire-safety, the built-in lubricity, oxidation stability, and corrosion resistant characteristics of Houghto-Safe fluids kept machine maintenance costs to a minimum. Performance was comparable to that of the finest petroleum oils . . . with the added advantage of fire-safety.

Houghto-Safe *fortified* fluids can give your hydraulic equipment and plants this same economical protection. And with it you get completely unbiased hydraulic service from the only manufacturer who offers three types of fire-resistant fluids (Water-Glycol, Phosphate-Ester and Emulsion Types) with compatible packings for any industrial hydraulic service.

FREE! 48-page Handbook of authoritative and helpful information on selection and application of fire-resistant hydraulic fluids and compatible packings. Write E. F. Houghton & Co., 303 W. Lehigh Ave., Phila. 33, Pa.

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ternal threading right to the top, provides maximum pull out resistance. (Newton Insert Co.)

For more data circle No. 34 on postcard, p. 177

Cleans Aluminum

For wrought and extruded aluminum alloys, a process cleans the alloys, removes all micro- and macro-corrosion and imparts to the surface a smooth, silvery appearance. (Frederick Gumm Chemical Co., Inc.)

For more data circle No. 35 on postcard, p. 177

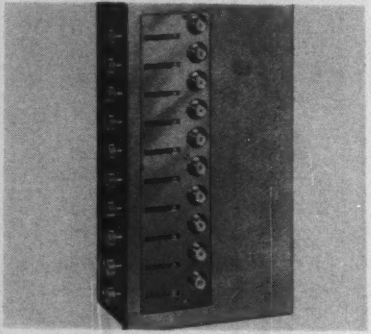
Band-Saw Blade

A double-carbide, special alloy band-saw blade, for standard cut-off band-saw machines, cuts 50-pct faster than carbon bands. It enables standard band-saw machines to operate at close to maximum efficiency. The new band also cuts a wider range of metals including tough alloy steels and results in greater blade life with reduced down time for blade changing. (The L. S. Starrett Co.)

For more data circle No. 36 on postcard, p. 177

Running-Time Meters

Ten individual running-time meters (each with its own signal light) are in a steel housing less than 7 x 13 in. They connect to ten different machines or operations to be monitored at distances to 5000 ft, and use safe low 26 v. They can be read, as ordered, to the nearest hour and tenth; hour, tenth and hundredth; minutes and tenths. They may be connected to show productive machine time; idle or lost time; down-for-service time. They are used to show production time, hours of machine use in the plant. In the office they are used to determine wages, bonus, schedules and incentives. When the meters are accumulating time, the corresponding signal light is visible over a hundred feet in daylight. (Gorrell & Gorrell)



For more data circle No. 37 on postcard, p. 177

Vibration Isolators

Three new, high- and low-temperature shock and vibration isolators, for electronic and industrial equipment, handle static loads from ½-25 lb. A fourth mount handles loads from about 25-60 lb. The high- and low-temperature mounts retain their effectiveness at continuous temperatures ranging from —100 to +500°F. They consist of two load-carrying springs, mounted in opposed directions, with a built-

EXECUTIVE REPORT #28

RING PLANT WRINGS OUT MORE PRODUCTION

with Super Tumblast®

WHEELABRATOR
WHEELABRATOR

With a 14 cu. ft. Wheelabrator® Super Tumblast, Muskegon Piston Ring Co. of Sparta, Michigan, has increased cleaning room output to meet increased production.

The Super Tumblast, installed late in 1959, has averaged 150 tons of production per week, cleaning a wide variety of gray iron castings. Throwing 100% more abrasive per minute than the blast equipment previously used, the Super Tumblast cleans 800-lb. mixed loads, producing superior finishes in blast cycles of only 5½ minutes.

Maintenance through months of continuous service has been negligible. Only routine lubrication, inspection and adjustments have been required. Blade life of over 400 wheel-hours per set is a result of the high efficiency of the new CFS Separator.

IT PAYS TO REPLACE INADEQUATE EQUIPMENT

Your Wheelabrator engineer will help you analyze impartially the economics of replacing obsolete blast equipment with the unsurpassed production power of a Super Tumblast. Without obligation, write to Wheelabrator Corp., 510 S. Byrkit Street, Mishawaka, Indiana. In Canada, P. O. Box 490, Scarborough, Ontario.

WHEELABRATOR
AIRLESS BLAST EQUIPMENT

in damper assembly to restrict resonant buildup. (MB Electronics)

For more data circle No. 38 on postcard, p. 177

Cuts Metal

Designed for metal cutting, aluminous-oxide, resin-bonded abrasive disks come in 7 and 9⅛ in. diameters, in a choice of five standard grains. The metal-cutting disks feature a pressurized 100-unit package with complete 360° protection by metal straps. An outer pliofilm bag keeps the disk package dust-free and prevents contamination by moisture in the air. (Chicago Wheel & Mfg. Co.)

For more data circle No. 39 on postcard, p. 177

Fluted Gun Drills

Gun drills with twisted or helical fluted shanks, provide smoother operation and better balance at high spindle speeds. The gun drills greatly reduce undesirable whipping and vibration, which is often encountered when medium and small-diameter, conventional gun drills are run at high rotational speeds. (National Twist Drill & Tool Co.)

For more data circle No. 40 on postcard, p. 177

Square-Body Valves

Seven new heavy-duty, square-body valves, operated manually and mechanically, have been designed for use as controls on fine quality machine tools. They also serve in other applications where compact, heavy-duty, precision-made control valves of deluxe appearance are needed. Valve bodies, levers and bases are either machined from bar stock or are cast. All parts are fitted to precision tolerances for extra smoothness and durability in service. (Humphrey Products Div., General Gas Light Co.)

For more data circle No. 41 on postcard, p. 177

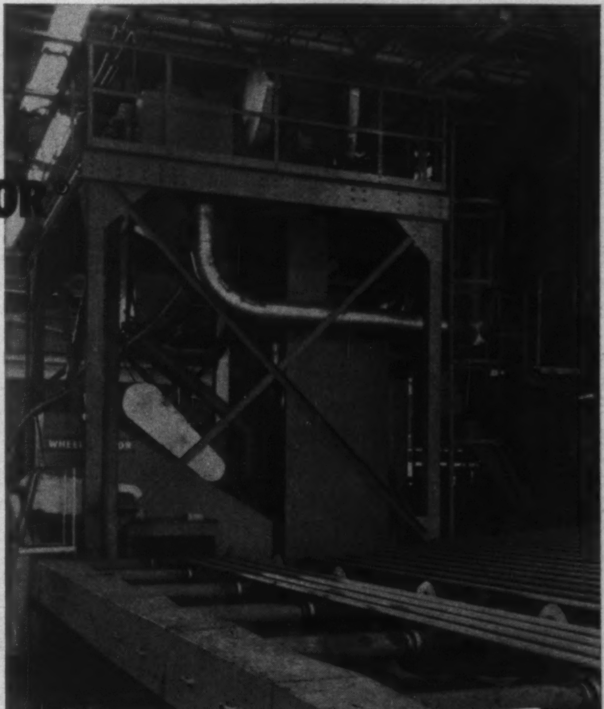
Indexing Chucks

Two-jaw indexing chucks enable manufacturers to perform multiple precision machining operations; on such highly-complex shaped workparts as gate and globe valve bodies, and bottle molds, in but one chucking operation. (The Cushman Chuck Co.)

For more data circle No. 42 on postcard, p. 177

Stainless Pipe

As-welded, unannealed stainless steel pipe is intended for use in systems where non-contamination



EXECUTIVE REPORT #30

AUTOMATED DESCALING WITH THE WHEELABRATOR®

The bar stock cleaning line in the new two million dollar Elyria, Ohio, Cold Draw plant of The Western Automatic Machine Screw Co., Div. of Standard Screw Co. utilizes one of six Wheelabrator descaling machines that have completely eliminated pickling in this modern plant.

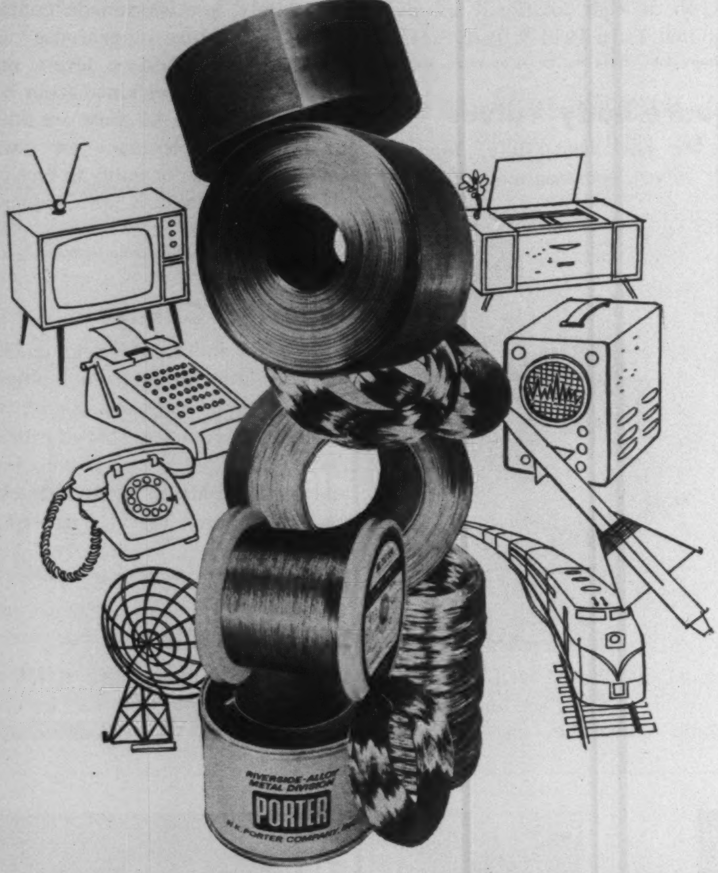
On the bar line, the Wheelabrator enables one man to handle the entire operation, from receipt of bar bundles, through an unscrambler, transfer to feed roll conveyors, through the Wheelabrator, and out onto a storage rack in line with the draw bench. For over 16 months of operation, round, square and hex bar stock, up to 4½" diameter in 15' to 45' lengths, has been descaled without any of the old acid pickling headaches. In addition, Western Automatic reports that Wheelabrator descaling provides a definitely superior product for subsequent cold drawing.

How To Automate Your Bar and Wire Drawing Lines

Details of Wheelabrator's cost-saving descaling method are illustrated in Bulletin 148-D. Write to Wheelabrator Corp., 510 S. Byrkit St., Mishawaka, Indiana. In Canada, P.O. Box 490, Scarborough, Ontario.

WHEELABRATOR
AIRLESS BLAST EQUIPMENT

FROM RIVERSIDE-ALLOY



"Put ups" by the ALLOYIST*
pay off in Production

There's a right *kind* of wire or strip "put up" for your production equipment . . . there's a right *size* for long runs and short runs. But, are you getting the kind and size of "put up" you need, *when* you need it?

The ALLOYIST has them all . . . spools, reels and Pay-Off-Paks for wire in overlapping weights 25 to 1000 pounds . . . strip by coil weight to 2000 pounds or exact lengths . . . rod in exact lengths or randoms. Start the job right. Order your alloys from the ALLOYIST for a pay-off in smoother production.

*Riverside-Alloy is the ALLOYIST to the electrical/electronic industry . . . a single, reliable source of strip, rod and wire in Nickel, Nickel silver, Cupro nickel, Stainless steels (ISOLOY), Phosphor bronze, Monel and Inconel . . . a supplier whose manufacturing processes insure your product superiority.

Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Riverside, New Jersey.

RIVERSIDE-ALLOY PORTER METAL DIVISION

H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

of the product is of primary importance. Also, it is intended where corrosion is a minor factor. (The Standard Tube Co.)

For more data circle No. 43 on postcard, p. 177

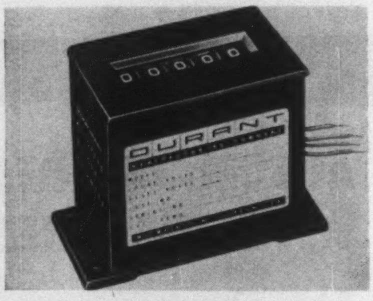
Measures Flow Rate

Flow-rate measurement meters operate at pressures up to 1500 psig. They come in ½- and 1½-in. sizes to handle flow in ranges from a minimum of 1.5 gph to 50 gpm. (Brooks Instrument Co., Inc.)

For more data circle No. 44 on postcard, p. 177

Electric Counters

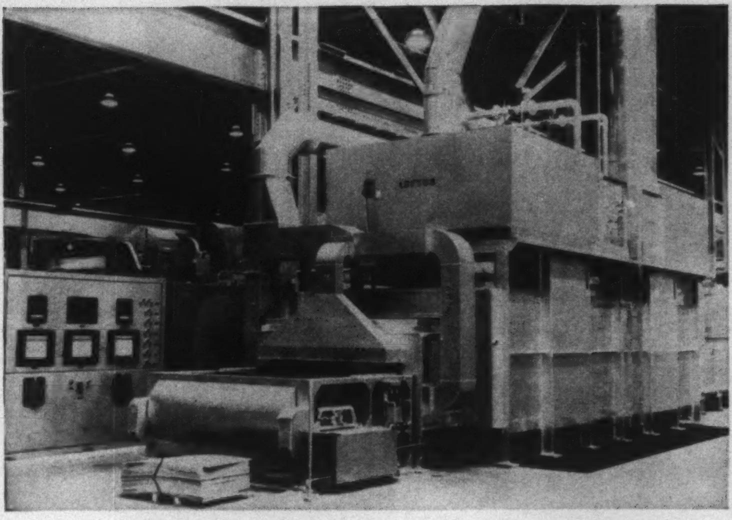
Finished in neutral instrument black, electric counters have a new high-speed drive internal mechanism. The mechanism allows it to run accurately and dependably; well over the conservatively rated 1500 counts per minute. The case is also sealed against production dust and cutting fluid splash and spray. The counters are widely used with electric computers, photo electric and remote-control counting instruments and for light production machines. There are four models, base mounting or panel mounting—with push-button instant reset or instant electric reset. (Durant Mfg. Co.)



For more data circle No. 45 on postcard, p. 177

Digital Voltmeter

For industrial applications, a transistorized digital voltmeter is accurate. It eliminates the costly operator errors which occur through misreading and misinterpretation during conventional measurement procedures. The unit is particularly applicable to production-line test-



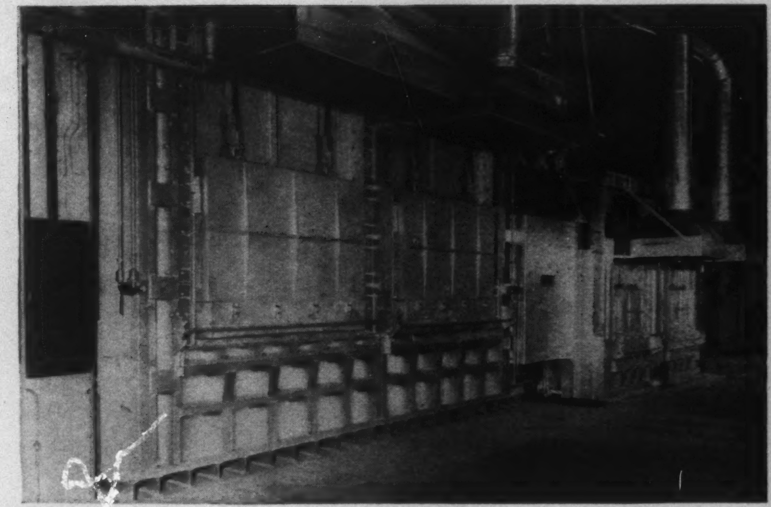
LOFTUS *Aluminum* FURNACES

for
melting, holding,
reheating, annealing,
homogenizing

The many repeat orders for Loftus furnaces are the best evidence of customer satisfaction. Loftus furnaces offer:

- **High Production**
- **Economical Operation**
- **Low Maintenance**
- **Rugged Construction**

Whether building or expanding, you too can benefit from the wealth of experience available from Loftus.

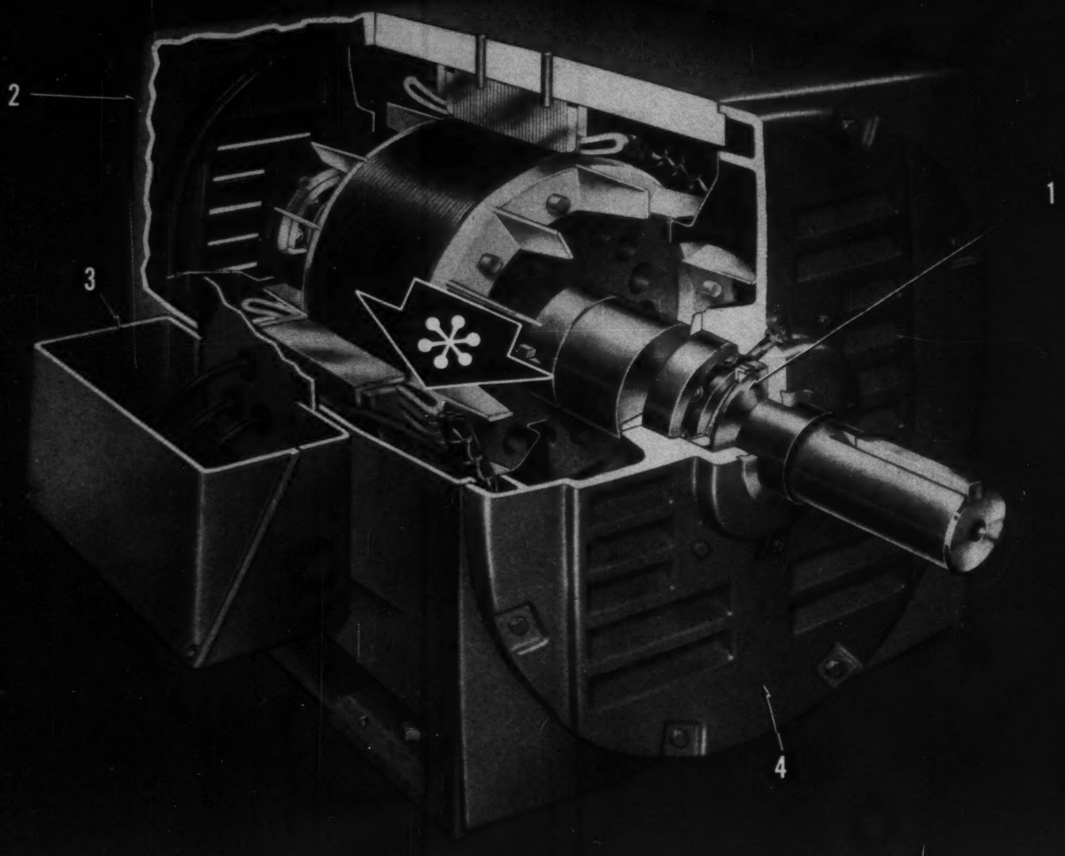


Loftus custom-builds complete plants and specializes in furnaces of all types and sizes for both ferrous and non-ferrous metals. Whatever your requirements, it will pay you to call on the engineering and construction know-how developed by Loftus over more than two decades of service to American metal producers.

From first heat to heat treat, look to

LOFTUS
Engineering Corporation
1 Gateway Center, Pittsburgh 22, Pa.

[illegible] DESIGNED FOR THE [illegible] INDUSTRY



➊ **NEW "POSITIVE-PURGING" BEARING SYSTEM** utilizes a rotating slinger to purge bearings of old grease and inhibit grease seepage along the shaft. Readily accessible grease fitting cuts maintenance time.

➋ **RUGGED CAST IRON FRAME** is built to give maximum protection on toughest jobs—frames are factory tested to withstand shocks in the magnitude of 20G. Shaft diameters have been increased in size to provide the strength and rigidity demanded by tough metalworking applications.

➌ **EXTRA LARGE CAST IRON CONDUIT BOX** simplifies installation and maintenance.

➍ **NEW, FLAT, CAST IRON END SHIELDS** are designed for durability, yet offer the lightweight, easy removal features which can cut hours and dollars from your maintenance schedules. Angled louvers assure both the effective protection and the maximum ventilating efficiency demanded of motors for metalworking applications.

IN ADDITION TO THE SPECIAL METALWORKING MOTOR FEATURES mentioned above, CUSTOM '8000' motors offer these superior "standard" features: replaceable prewound stator cores reduce maintenance costs; frames are designed to NEMA standard mounting dimensions to simplify installation; dynamically balanced, cast aluminum rotor windings and fan provide maximum reliability.

CUSTOM '8000' MOTORS are manufactured to the rigid quality specifications General Electric has adhered to for over 80 years. Today, with the implementation of advanced design and manufacturing techniques, G.E. can accurately and economically *Customize* motors to your specific requirements through utilization of motor components engineered exclusively for metalworking applications.

** Trade-mark of General Electric Co.*

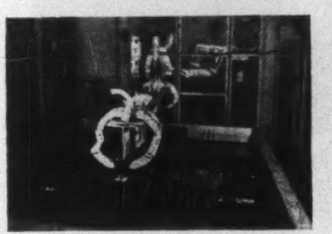
MEDIUM AC MOTOR AND GENERATOR DEPARTMENT

GENERAL ELECTRIC

EXCLUSIVE
POLYSEAL ✻
INSULATION
SYSTEM
LENGTHENS
MOTOR LIFE

General Electric's new Polyseal supported silicone rubber insulation system is highly resistant to contaminants and abrasion—gives maximum winding protection for rolling mills, auxiliaries, punch press and equally tough metalworking applications.

The Polyseal system assures superior mechanical, thermal, voltage and environmental endurance. This form-wound insulation is a vulcanized system "built-up" from silicone rubber tape reinforced by a glass and Dacron† fabric. Polyseal both retains its resilience and provides a positive seal against moisture and contaminants.



POSITIVE MOISTURE PROTECTION is assured by "under water" production line tests. For example, 2300-volt, form-wound Polyseal coils are water soaked for one-half hour—then "hi-potted" at 8000-volts while still completely immersed—to prove the insulation system is absolutely sealed.

† Registered Trade-mark DuPont Co.

CALL YOUR
GENERAL ELECTRIC
APPARATUS SALES OFFICE

for full information on CUSTOM '8000' motors for the metalworking industry, or write for Bulletins GEA-6865 and GEA-6889, to Section 884-13, General Electric Company, Schenectady 5, N. Y.

Progress Is Our Most Important Product
GENERAL ELECTRIC

ing, quality control, and receiving and shipping inspection. (Cubic Corp.)

For more data circle No. 46 on postcard, p. 177

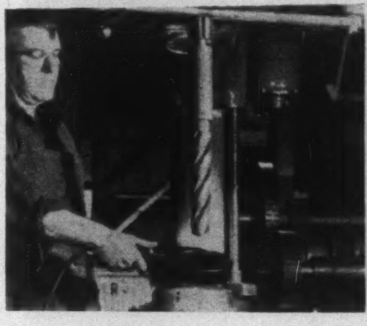
Digital Readout

A readout display operates directly from binary input. It eliminates the need for a decoding device to translate binary information into decimal information. The unit automatically decodes any BCD code up to six bits into numeric, alphabetic, or special symbol character presentation. The device is designed for use with digital computers, control equipment, instruments, and other electronic or electrical test equipment. (Industrial Electronic Engineers, Inc.)

For more data circle No. 47 on postcard, p. 177

Demagnetizer

For demagnetizing twist drills, taps, lead screws and many other small parts, a lightweight demagnetizer will also demagnetize the visible portion of drill press spindles. It's simple to operate: plug into any 110-v ac line, press the readily accessible spring-loaded switch. (Bux Magnetic Products, Inc.)



For more data circle No. 48 on postcard, p. 177

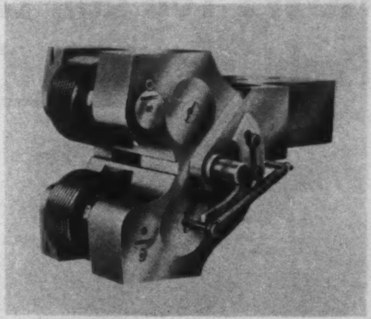
Sealing Grommet

A "hook-in," "snap-in," "stay-put" cellular sponge plastisol molds to suit any required situation; in any size, shape or dimension. Its unusual design with spring steel retaining tabs insures positive seal between grommet membrane and sheet metal. It lends itself to any specified shape for safe and positive insulation around wires, conduit tubes, pipe, loom or cable. The grommet provides protection for ragged edges of blanked holes and offers an unusually high degree of efficiency in eliminating sound and vibration. (Automotive Rubber Co.)

For more data circle No. 49 on postcard, p. 177

Thread Rolling Device

A new thread rolling attachment rolls a diametrical range from 1½-3¼ in. As with the other five sizes available, this attachment is applicable to turret and tracer lathes and to the larger automatic chuckers and bar automatics. However, when it is applied to lathes, it must be used on machines equipped with power cross feed. (Landis Machine Co.)



For more data circle No. 50 on postcard, p. 177

Rotary Table

A 15-in. diam rotary table combines the features of: indexing each degree (360 indexes); free rotation of table; tolerances of ±10 seconds. (Morey Machinery Co. Inc.)

For more data circle No. 51 on postcard, p. 177

Air Conditioning

High-temperature problems, inherent in electronic console enclosures, can now be completely eliminated by a lightweight, compact refrigerated air conditioning system. Module designed, it meets MIL-E-1640B. Of strong unitized construction, it is 7-in. wide, 10½-in. high, and 22¾-in. long. The system weighs 55 lb. The system air conditions and filters the internal recirculated air which is cooled to an average air temperature of 82°F (28°C). Maximum console return air temperature is kept to 95°F (35°C). (Monrovia Aviation, subsidiary of Telecomputing Corp.)

For more data circle No. 52 on postcard, p. 177

All-Purpose Fitting

Easily installed, a four-seal T-fitting now eliminates the need for adapters, connectors and special fittings when applying pressure gages or other instruments to hydraulic, pneumatic and process lines. The fitting gives the benefits of a single-piece installation. The fitting embodies four positive seals against pressure, temperature, vibration, surge, plus vibration dampener. (C. B. Crawford Co.)

For more data circle No. 53 on postcard, p. 177

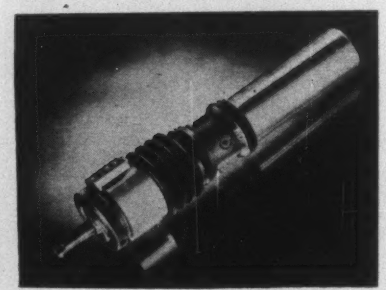
Rotary Switch

Sturdy and compact, a 12-position rotary switch provides single-knob control of as many as 75 poles per switch. It is available in any number of sections from one to twenty-five, and with a wide variety of contact arrangements. The switch is suited to complex-circuit controls as well as to tap, transfer, and selector service. (Electro Switch Corp.)

For more data circle No. 54 on postcard, p. 177

Tool Holders

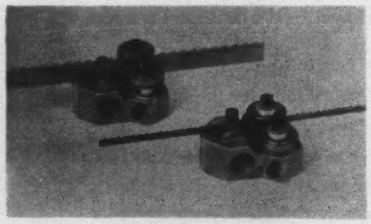
Recess tool holders are designed for tape-controlled or automatic machines which normally have confined areas for tool changes and/or storage. Its working section, shortened about 40 pct, does not sacrifice any of the range. The holder has greater travel than that normally provided with holders of this size. The feed-out of the cutter is in ratio of 1:1 to the spindle, thereby eliminating any mathematical calculations or interpolations for setup or cutter design. (Maxwell Industries, Inc.)



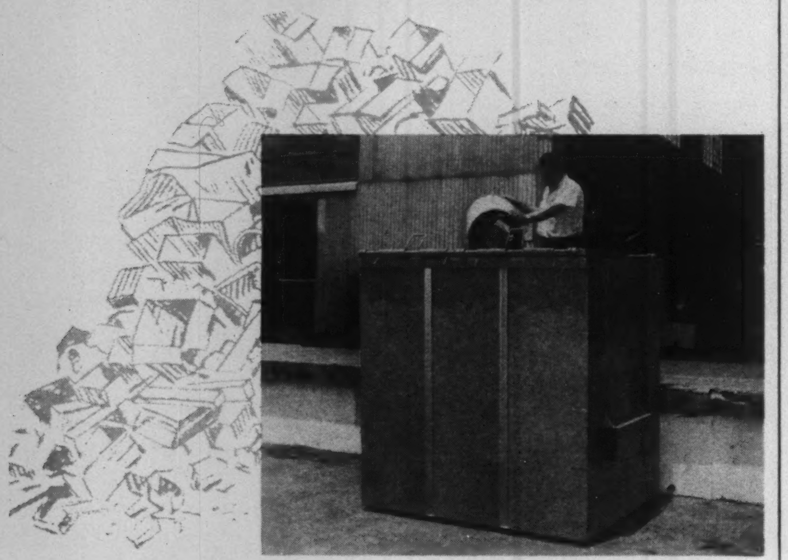
For more data circle No. 55 on postcard, p. 177

Band-Saw Guides

For use on 14-, 16-, 18- and 20-in. machines, or for light and medium work on larger machines, a line of small band-saw guides features ball-bearing support. Another feature is thrust rollers specially constructed and sealed for accurate performance and long life under maximum load conditions.



NOW! You Can End Refuse Storage Problems...WITHOUT Capital Outlay



DUMPMASTER-Equipped Private Haulers Provide Containers and Efficient Service

If you're plagued with trash piles, scattered refuse, fire hazards, and hit-or-miss collection, there's a good chance you can do something about it . . . WITHOUT CAPITAL OUTLAY!

In most major cities DEMPSTER-DUMPMASTER-equipped private haulers will put clean, big-capacity storage containers at convenient locations in your plant . . . empty them mechanically on schedule, or on a call-in basis . . . all for a reasonable monthly fee.

When you containerize your refuse, plant housekeeping becomes easy, employee morale goes up.

Write today for the name of your nearest private hauler. We'll also send literature describing his service.

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Write Today for Free Brochure and Name of Nearest Private Hauler

DEMPSTER BROTHERS
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An eccentric, adjusting device permits ready adjustment to handle any blade from ⅛-¾ in. in width, at speeds up to 8000 fpm and thrust loads up to 50 lb, in complete absence of friction. (Carter Products Co., Inc.)

For more data circle No. 56 on postcard, p. 177

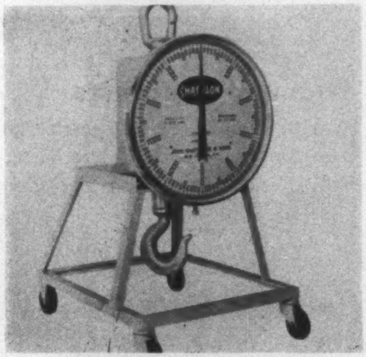
Pressure Regulators

Two-stage, gas pressure regulators serve for both oxygen and acetylene cylinder use in welding, heating or cutting operations. The gageless regulators are particularly useful where much rough usage is encountered; where continuous quality performance is necessary. (Air Reduction Sales Co.)

For more data circle No. 57 on postcard, p. 177

Crane Scale

Five crane-scale models—3, 5, 7½, 10 and 15 ton—all have an accuracy of 1/10 of 1 pct of capacity. This scale makes weighing stations obsolete because the load is accurately weighed as it is moved. The scale is trouble free and expense free, because there are no fluids to replace and it doesn't need oiling. This rugged scale has a case of cast aluminum and cast iron. It is unaffected by normal weather or temperature changes. (John Chatillon & Sons)



For more data circle No. 58 on postcard, p. 177

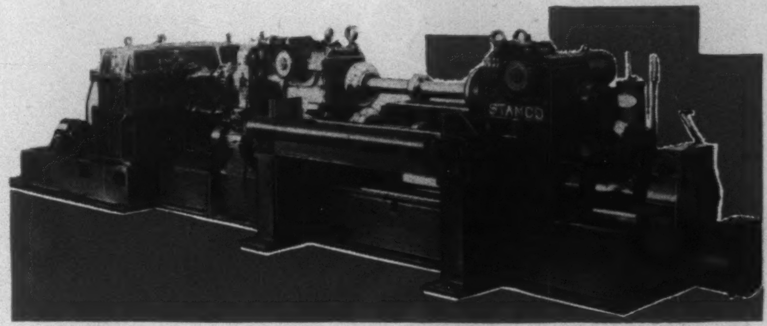
Shear Blades

Solid steel and laid shear blades meet specific production requirements to insure low cost, accurate and continuous performance in every shearing application. Eight grades of steels are used according to particular job application. These special steels, combined with rigid quality controls, mean greater tonnage sheared between grinds, lower tooling costs, and fewer rejects. (Simonds Worden White Co.)

For more data circle No. 59 on postcard, p. 177

Shear-Proof Punch

Punching, notching and trimming steel, and all light- and medium-gage materials up to 0.125-in. thickness, without shearing, is possible



Top efficiency and versatility at low cost with Stamco side trimmer

A wide range of equipment is available for warehouse and mill duty on ferrous or non-ferrous materials.

Stamco can solve your particular problem—economically.

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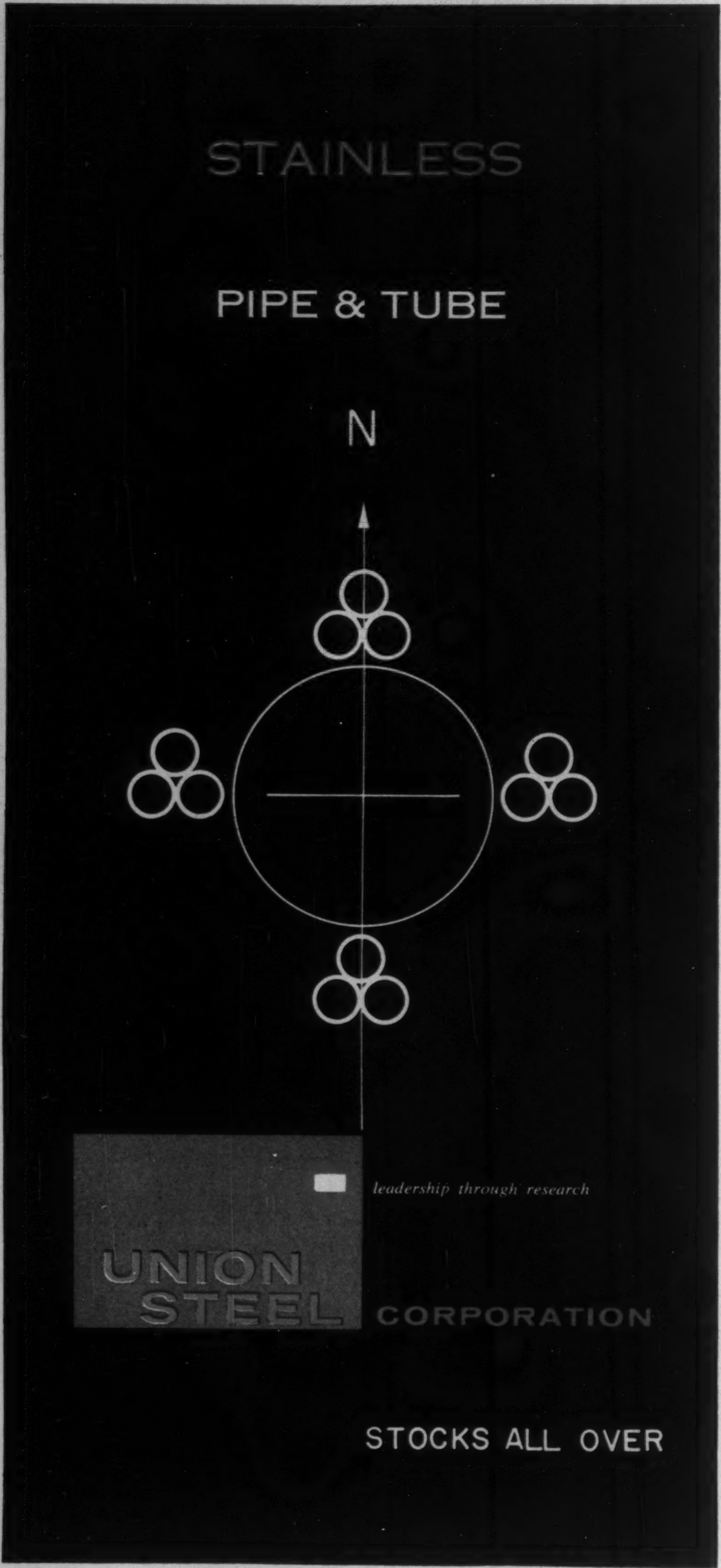
Slitting and Coiling Lines • Cut-To-Length Lines • Flying Shear Lines • Power Squaring Shears • Automatic Resquaring • Corrugating, Culvert and Steel Mill Equipment

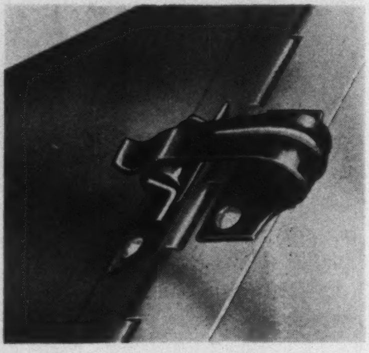


by using a shear-proof punch. Punch and die are kept in precise alignment at all times by high-tension, spring-loaded alignment pins. In operation, the pins will retract to allow for work piece. The unit is made of tool steel, and is precision ground and bored. (Anetsberger Bros., Inc.)

For more data circle No. 60 on postcard, p. 177

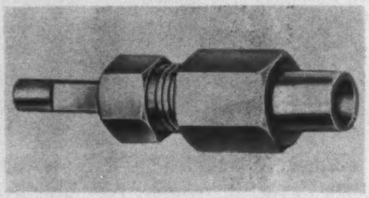
Retaining Springs

Using the hinge as a fastener, this tiny device provides easy access to small doors. Installed on the inside of equipment, the spring is completely invisible from the outside. When the door is shut, the spring keeps it shut. When door is open, positive spring tension keeps it open. The door retaining spring consists of a tiny steel spring and cam device that holds a door firmly in both open and closed positions. (Southco Div., South Chester Corp.)



For more data circle No. 61 on postcard, p. 177

Vacuum Couplings

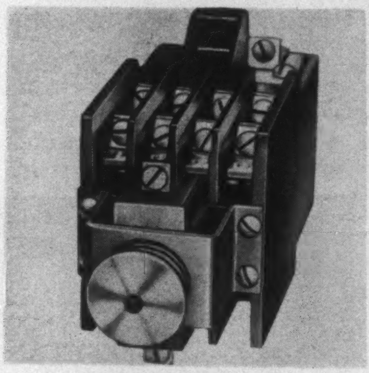


With the use of ultra-high vacuum couplings, no leaks are detectable or measureable on a Helium Mass Spectrometer with a sensitivity of 1.7 x 10^{-10} atmospheres cc/second/division. In addition to

the simplicity of repeated assemblies, this unique all metallic design will permit operation at elevated temperatures. (Cajon Machine Co.)
For more data circle No. 62 on postcard, p. 177

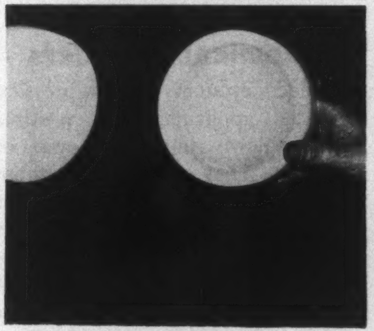
Control Relay

Compactness and dependability are the main features of a new type industrial control relay. The relay is rated at 6 amp, 300 v maximum. The unit is a fixed circuit device with provisions for eight independent poles. Specifically tailored to the demands of automation, the relay requires up to 70 pct less panel area than conventional relays. (Cutler-Hammer)
For more data circle No. 63 on postcard, p. 177

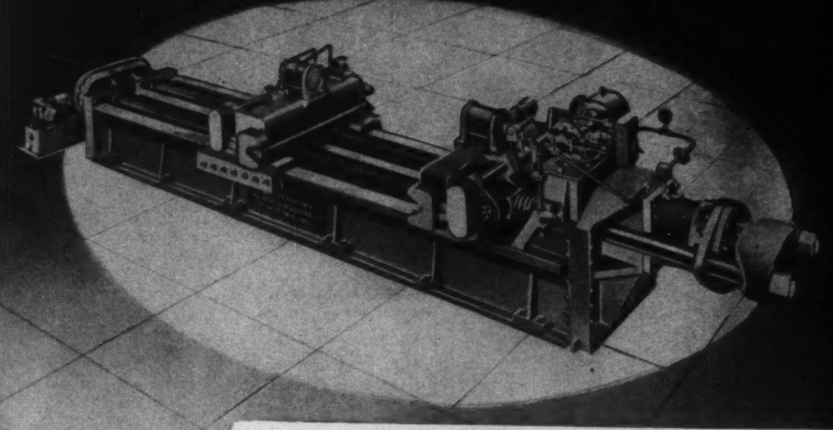


Makes Prototypes

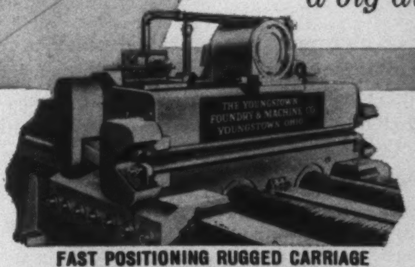
Branch or linear polyethylene or polypropylene, in the form of rod and block, to produce prototypes for specific application analysis can mean important savings to companies planning the eventual production use of these polyolefin materials. Rods and blocks of polyolefin can be sawed or rough machined to a base shape and finish machined with conventional ma-



"YOUNGSTOWN"
New Carriage-Type Design
STRETCHER LEVELER



a small difference in design makes a big difference in RESULTS...



FAST POSITIONING RUGGED CARRIAGE

WEDGE TYPE HEADS with WAFFLE TYPE GRIPPER JAWS assure flatness of sheet-ends.

Rugged Three Way fabricated Steel Bed insures utmost rigidity.

- *CONSERVES VALUABLE FLOOR SPACE*
- *SPEEDS STRETCHING OPERATION*
- *AIDS QUALITY CONTROL*

The Hydraulic Stretcher Leveler pictured is 800,000# Capacity capable of stretcher leveling mild cold rolled sheets 30″ to 62″ wide, 30″ to 168″ long, up to .180″ thick in either single or multiple sheets.

A complete range of sizes . . . built from 10,000# for aluminum extrusions to 2,000,000# for stretching plate. New performance throughout a long life of service is assured by traditional "YF&M" rugged construction. Write for Complete Information.

The Youngstown Foundry & Machine Company
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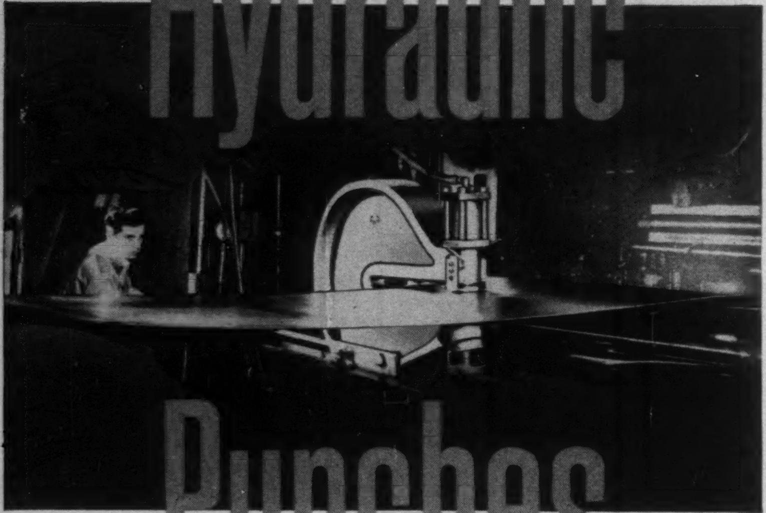
Hydraulic Punches



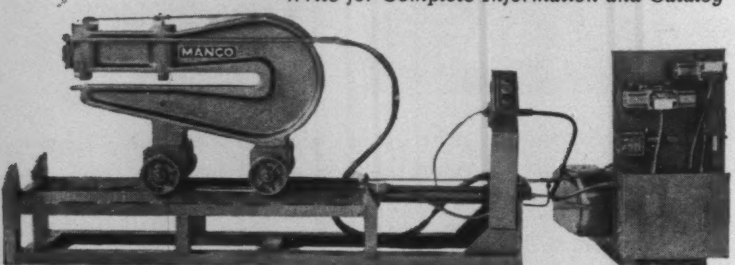
FOR METALLURGICAL TEST SAMPLES
PRODUCTION APPLICATIONS

Manco offers a wide variety of high pressure hydraulic punches for obtaining metallurgical test samples and for production punching applications. Typical is the metallurgical test sampling unit shown above. It punches a burr-free undistorted, 4" diameter sample from .070 mild steel in 2 seconds cycle time. Units can be roller mounted where required. Punches for bench mounting in laboratory also available.

WELD IDENTIFICATION PUNCH

This Manco traverse mounted punch is used to punch "warning holes" adjacent to welds in steel strip. Two burr-free $\frac{3}{16}$" holes are punched simultaneously through .150 sheet steel on 12" centers. Punching cycle is 1 second. The wheeled traverse and punch operation is actuated by a single pushbutton. Complete cycle, 6 seconds.

Write for Complete Information and Catalog



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MANCO MFG. CO.
BRADLEY
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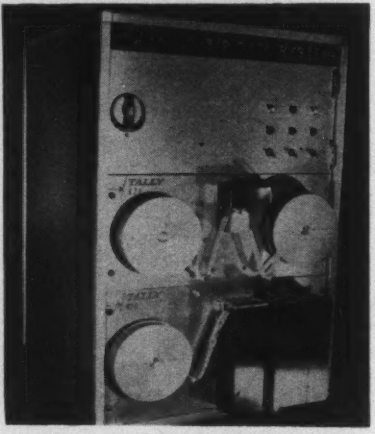
chine tools. A company may use either of these semi-finished components to make a prototype meet individual requirements. The use of rod or block allows a company the budgeting luxury of making several different prototypes for testing and evaluation. (The American Agile Corp.)

For more data circle No. 64 on postcard, p. 177

Paper-Tape Translator

For high-speed translation of paper tape codes and conversion of information between IBM cards and tape, a low-cost system performs paper tape code-to-code conversion at 60 tape characters per second. For tape-to-card or card-to-tape conversion, speed is about 20 card columns per second. (Tally Register Co.)



For more data circle No. 65 on postcard, p. 177

Economical Cylinders

Added economy in low-pressure cylinder applications is possible with a newly improved series of cylinders. They can be used without any modification in either air or hydraulic systems. The cylinders incorporate the reverse trim packings and multiple-lip rod wiper that cleans in two directions to deliver a dry rod on the outstroke. They can be used for all types of industrial applications at pressures up to 200 psi air and 500 psi oil or water. (The S-P Mfg. Corp.)

For more data circle No. 66 on postcard, p. 177

How to write a work report in ten seconds flat

collectadata transmitter

"Keeping track" is a fantastic problem in today's factory. Far and away the best (and cheapest) solution is a Friden Collectadata system. It works like this:

1) Work orders are issued in the form of tab cards or edge-punched documents.
2) When a job is completed, the worker puts his card in a Collectadata transmitter and touches a button.
3) The Collectadata receiver in the data center receives and automatically punches the information into a paper tape and records the time.
4) At day's end, the tape is processed—fed either into tape to tab card converter, or directly into computer to prepare a complete summary of work activity.

All plant activity — from receiving dock to shipping room — can be reported and recorded by this same simple method. For information, talk to your Friden Systems Man or write: Friden, Inc., San Leandro, Calif.

THIS IS PRACTIMATION: automation at the source of data with practical, sensibly priced equipment.

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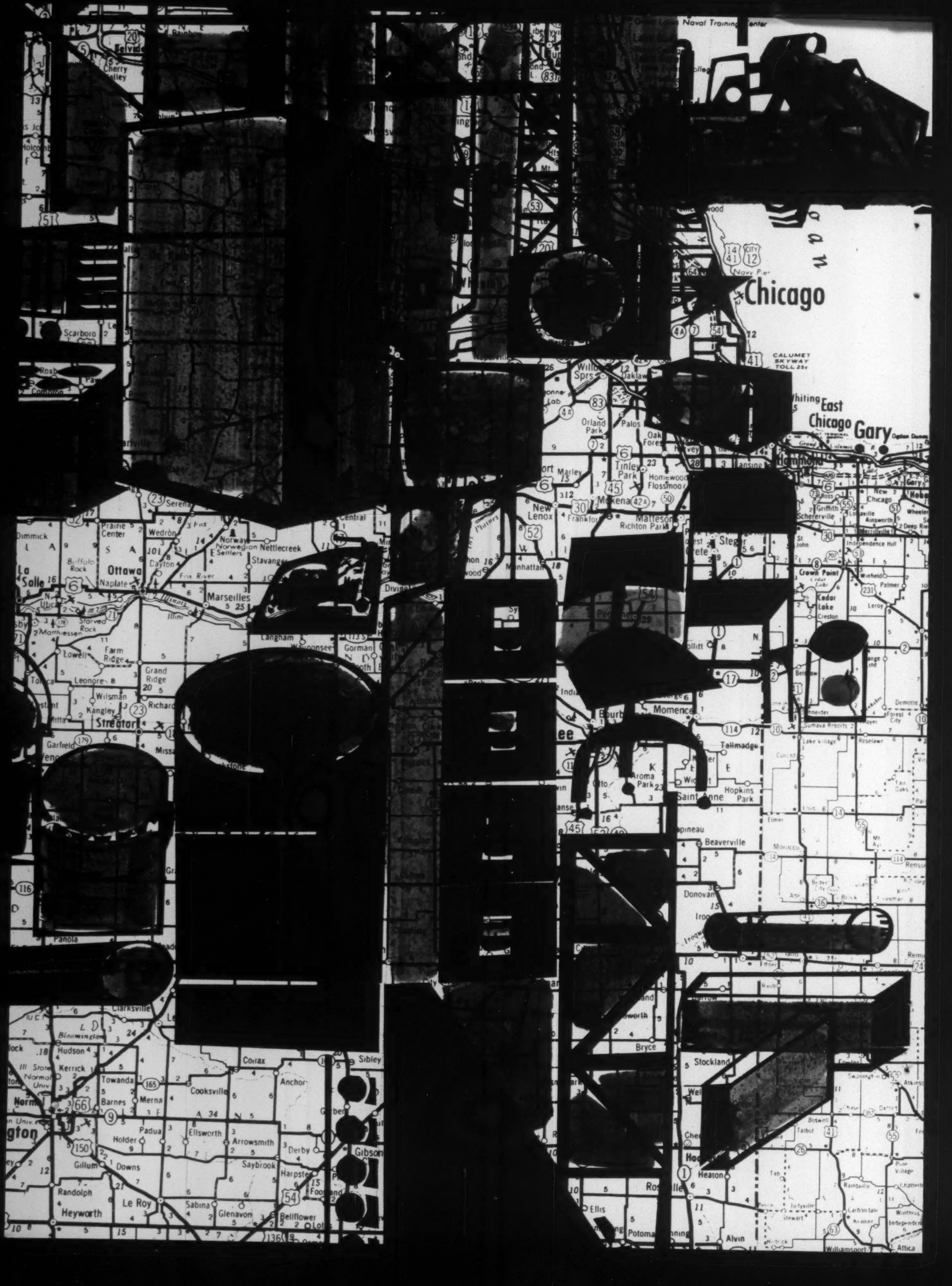
SALES, SERVICE AND INSTRUCTION THROUGHOUT THE U.S. AND THE WORLD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Matteson
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Steger
Crete
Lansing
Crown Point
Cedar Lake
Griffith
Schererville
Momence
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Arrowsmith
Saybrook
Holder
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ONE OF A SERIES DEPICTING MARKET AREAS SERVED BY INLAND • ART BY BOB KEYS

INLAND STEEL IS HERE

Here, in 1893, Inland Steel was born. And here, in the world's number 1 metal-working region, Inland has unceasingly served. Poets have described Chicago and its neighboring industrial cities as a tough-muscled giant—knowing no limit to its creativity. From this area—Inland's "home" territory—girdling Lake Michigan like a crescent from the northern boundary of Illinois up through lower Michigan, come a cornucopia of products—radio and TV sets, home appliances, office furniture and equipment, heavy duty machinery, materials handling equipment, contractor's products, drums, cans, automotive parts, electrical and railroad equipment—almost every product made of steel.

And with the growth of this area, Inland has steadfastly kept pace—is today the only major steel producer headquartering in the area—one of the leading completely integrated steel companies in America—owning its own mines, quarries, ore carrier fleet—its rate of production expansion is greater than the rate of total steel production expansion for the entire nation.

Here, in Chicago, is a shining skyscraper of steel and glass—Inland's home office—hub of an enterprise now reaching out over the midwestern states from Canada to the Gulf of Mexico. Big, it has grown—big enough to meet every need of the users of steel. Yet the men at Inland, for Inland is men, are fully aware of the basis of that growth—the warm personal relationships with every Inland customer. Because Inland is here—has been here for 66 years—Inland *knows* the area—knows its technical requirements, its manufacturing methods, its people. No "in-and-outer," Inland has tried always to be of service with dependable delivery, metallurgical counsel and quality steels.

Here, also, the aim of Inland men is to be truly a part of the community—buying equipment and supplies within the area—lending a hand where they can in educational and civic enterprises—doing their utmost to provide an ever-growing service to midwestern industry.

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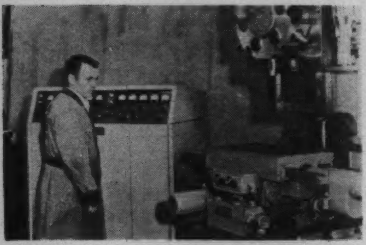
INLAND

66 years of service to the Industrial Middle West

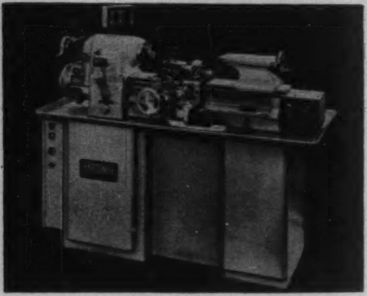
New Equipment and Machinery



Positioning System is Completely Transistorized

Numerically controlled, a point-to-point positioning system is accurate to 1/10,000 of an inch. Including a positioning table on the drilling or milling machine, the system utilizes punched paper tape. The tape comes from a specially-designed typewriter. With this tape, the system makes a turret drill or other machine tool repeat its task automatically, without deviation. It is usable for any positioning application. (Micro-Path Inc.)

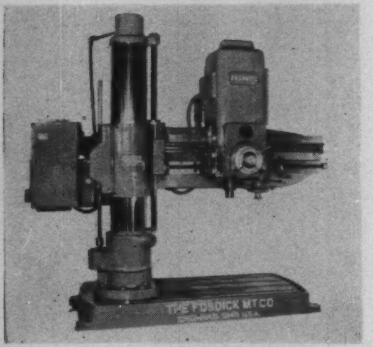
For more data circle No. 75 on postcard, p. 177



Precision Lathe Has Infinitely-Variable Speeds

Filling the gap between the plain precision bench lathe and the heavy-duty engine lathe, a new lathe has an 11-in. swing over the bed. Another feature is infinitely-variable speeds of 125-3000 rpm, by means of a push-button controlled electrical-actuated variable-speed drive. The larger headstock frame and large super-precision preloaded ball bearings provide maximum precision for sustained operation at full speed. The bedways are of the wide dovetail design. The lathe also has built-in automatic thread length control. (Hardinge Bros., Inc.)

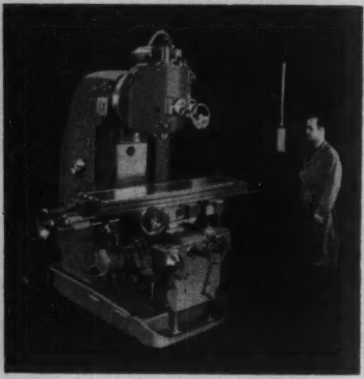
For more data circle No. 76 on postcard, p. 177



Drill Offers Preselection and Hydraulic Control

Rigid and durable, a radial drill features preselection dials for easy selection of the proper speed and feed for the next operation. Actuated by the spindle control lever, a hydraulic shift of 36 speeds and 18 feeds relieves the operator of manually shifting the machine. A powerful magnetic multiple disk clutch transmits power feed. Arm and head traverse is by means of a single lever that controls hydraulic valves, providing variable traverse speeds. This permits accurate positioning in a minimum of time. Hydraulic feed interlock clamps the head and column when the feed is engaged. This saves the operator the manual-operation time. (The Fosdick Machine Tool Co.)

For more data circle No. 77 on postcard, p. 177



Milling Machine Cuts Cross-Wise to The Table

A knee-type milling machine features a swivelling head and a power quill. The swivelling head makes possible angular milling cuts crosswise to the table. The power quill is for boring and drilling operations square with the face of the angular cuts. A pendent control panel provides machine start and stop, spindle start and stop, spindle reverse, coolant, power rapid (jog), quill feed and rapid. The machine has 24 speed selections by dial, ranging from 20-1600 rpm. The table, with 15- x 65-in. working surface has 36-in. longitudinal travel, 12-in. cross travel, and 18-in. vertical travel. Top of table to spindle face is 0 in. minimum to 22¾ in. maximum. Automatic backlash eliminator permits climb milling in either direction. (Sundstrand Machine Tool)

For more data circle No. 78 on postcard, p. 177

Temper Mill

A temper mill, handles coiled strip up to about 50-in. wide and as narrow as 25 in. It is used to temper stainless gages in the range between 0.016 in. and 0.140 in. (E. W. Bliss Co.)

For more data circle No. 79 on postcard, p. 177

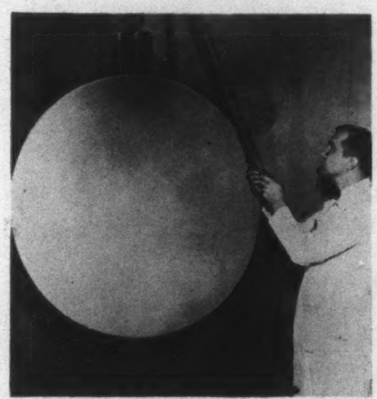
Hoist Crane

Rubber-tired, a hoist crane features 360° full revolving crane. The crane is mounted on a heavy-duty ballbearing turntable-boom pivoted well forward on chassis to provide working reach of entire boom length. The truck is equipped with dual traction tires, meaning high flotation with maximum protection against tire blow-out upsets. The hoist also has a gasoline engine. (Silent Hoist & Crane Co.)

For more data circle No. 80 on postcard, p. 177

Lifting Tabs

Supplied with clad metal tube sheets are welded-on lifting tabs to minimize handling problems. The 4 x 6-in. long, 1-in. thick tab is welded to the base metal of the tube sheet. It is drilled to accept a standard ¾-in. clevis pin. After



NOW! GET FULL-POWER FIRE FIGHTING WITH KIDDE'S DRY CHEMICAL LINE!

2½ and 5 pound pressurized units! Granted top rating by U.L., these two units pack the extra punch needed to get the jump on fire. For example, the 2½ pound Kidde unit is as compact as a 1 quart carbon tet model, yet is eight times as powerful! Both the 2½ and 5 feature simple, two-step operation, easy-to-read dust-and-moisture-proof gauges. 10 pound dry chemical also available.

20 and 30 pound pressurized dry chemicals! Both these Kidde units have the same good features of the 2½ and 5, plus some "extras" all their own. Center balanced for fast action, rugged diffuser horn, speedy trigger operation, recessed pressure gauge and enclosed mechanism.

200 pound dry chemical wheeled unit! Kidde's 200 pounder discharges a 40-foot stream faster, has an *extra* 50 pounds of fire-smothering dry chemical to knock down fire quicker. Low center of gravity and wide wheels make it easy to maneuver. Easy-to-use discharge control makes operation simple.

400 pound stationary unit! Here's maximum protection in a minimum package! Like all Kidde units, this features sure, dependable performance and fast, easy operation. Either wall-mounted or free standing, leakproof and tamperproof, exclusive Bridgeman Seal, universal long-range nozzle, easy-to-read pressure gauge. 200 pound model also available.

Get the jump on oil, gas and electrical fires! Learn more about the complete line of dependable, efficient Kidde equipment—write today!

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CM — mark of quality chain.

it's **BRANDED** for lifetime identification

it's **SAFER** because you can be sure of its grade (strength)

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In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

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handling is completed, the tab is easily removed by torch or other cutting methods. Safety and economy are the principal advantages of the new lifting tab. (Bridgeport Brass Co.)

For more data circle No. 81 on postcard, p. 177

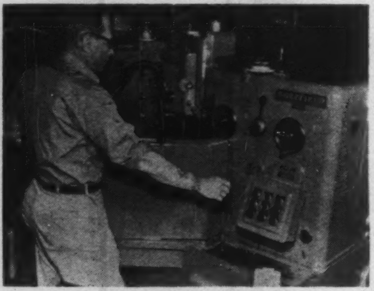
Prevent Chip Deposit

Deposits of cast-iron chips on chucks and machines can now be prevented with a new machining compound. It also stops rust of chips, parts and tooling. Maintenance of machines, tools and fixtures is thus reduced. (Baker/Gubbins Co.)

For more data circle No. 82 on postcard, p. 177

Gear Grinder

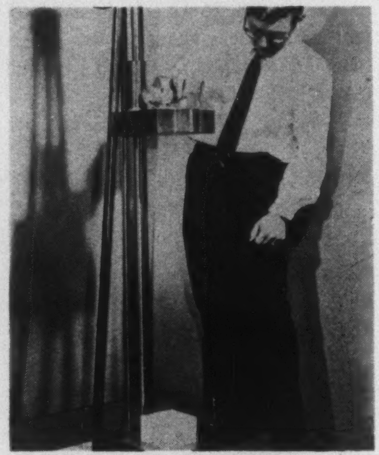
A precision gear grinding machine grinds external precision spur and helical gears from 8-100 diametral pitch. A number of gears of the same type can be ground at the same time from hardened steel in preformed or solid blanks, or gears can be ground individually. The grinding operation is similar to hobbing in that the work rotates continuously at a rate of speed synchronized with that of the grinding wheel. The standard machine will accommodate a maximum work diameter of 8-in. OD x 5-in. face width. (The Sheffield Corp.)



For more data circle No. 83 on postcard, p. 177

Shock Testing Machine

For the drop testing of electronic devices and other fragile equipment up to 150 lb in weight, a shock testing machine finds fragility of product itself. It can also be used to test ability of cushioning material to meet military and commercial specifications. The shock tester weighs about 100 pounds, is 68-in. high and occupies 14- x 16-in. floor space. (Hardigg Industries)



For more data circle No. 84 on postcard, p. 177

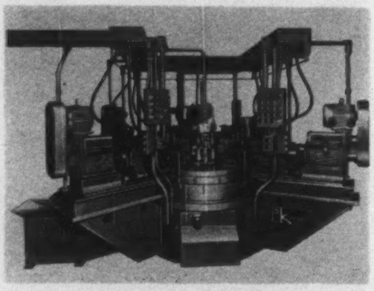
Welders' Goggles

Soft, vinyl plastic goggles feature a protective vinyl noseguard and unbreakable nylon insert. It molds to face contour to provide welcome comfort. It also fits with ease over prescription glasses. Other features include six lightproof, indirect ventilators to eliminate harmful light rays and fogging, and removable rings. (Glendale Optical Co.)

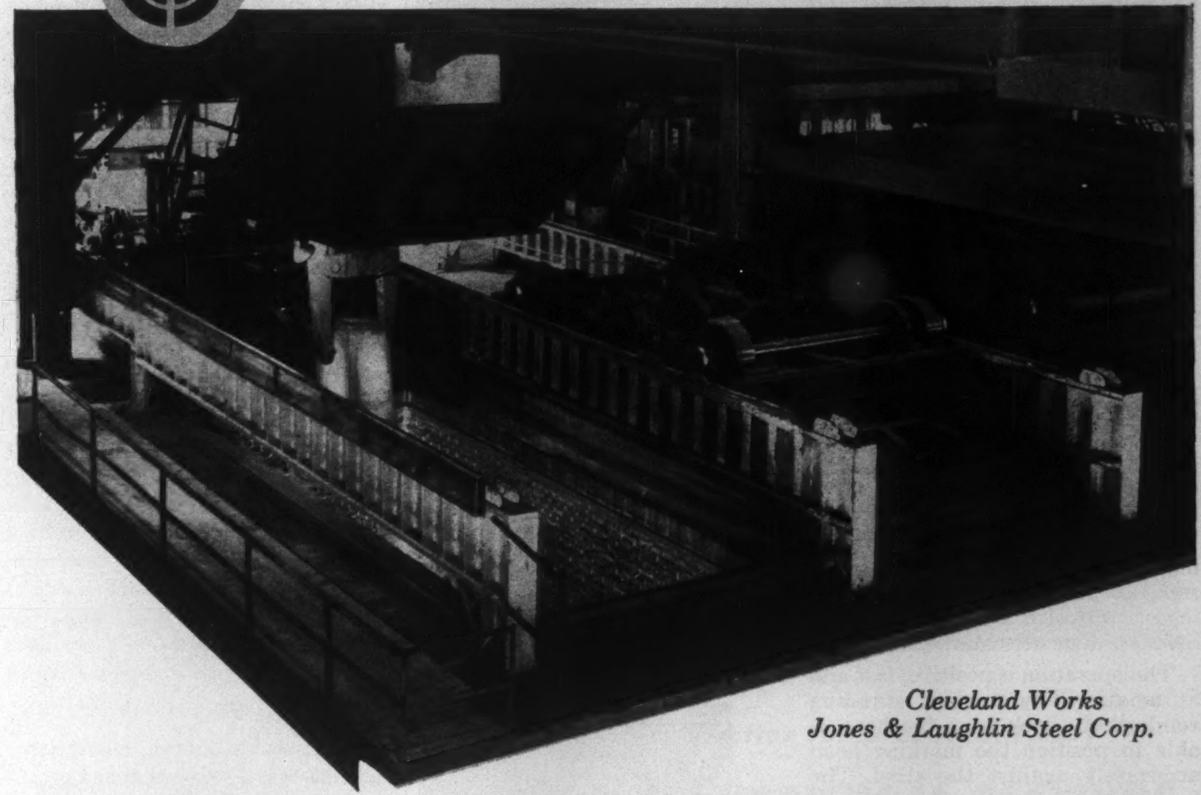
For more data circle No. 85 on postcard, p. 177

Radial Index Machine

During a 13-second cycle, a six-station, horizontal radial index machine performs sixteen operations on aluminum automotive pistons. Handling two pistons at the same time, the new machine drills, mills, chamfers and slit-saws in one continuous operation. The machine features a 40-in.



NEW SOAKING PITS



Cleveland Works
Jones & Laughlin Steel Corp.

New Soaking Pits recently built and placed in operation by AMCO at the Cleveland Works of Jones & Laughlin Steel Corporation.

Using metallic recuperators, the design of these pits features simplicity, economy and efficiency throughout.

Amsler Morton Company is a world-wide leader in the design of soaking pits and other steel heating furnaces. This broad experience and engineering competence can also lead to worthwhile economies in your plant.

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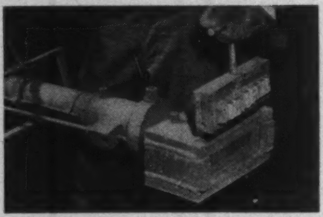
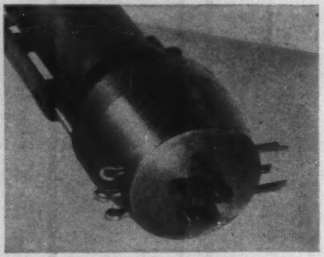
MANOR BUILDING
PITTSBURGH 19, PA.

This worker at the Coatesville, Pa. plant of Lukens Steel Company is using a Pannier Marker equipped with the newly-designed magazine-style marking head to stamp hot slabs with an identifying number.

Hot Steel Marking by controlled impact



This fast-change stamping head shown in operation above uses a type magazine. By the use of spare magazines for type changes, a new set of numbers can be dropped in place in seconds.



Hardened type is easily released for change in this style Pannier marker head by sliding out the pins. This head is effective where numbers are repeated on several pieces.

Pannier markers are now available for automated operation for larger billets and slabs. This numbering head contains a series of number wheels, rotated and set by push button, tape or card control. The entire marking operation can be completed by programmed remote control.

Uniformly clear stamping of heat or ingot numbers on billets or slabs, or serial or part numbers on hot forgings is provided by Pannier Single Stroke Pneumatic Markers.

The operation is positive, fast and automatic. The worker, standing comfortably back from the heat, is able to position the marking head accurately against the steel. The hammer first aligns itself, trips itself and makes the impact automatically.

The new head shown here incorporates a fast-change typeholder that permits users to change entire type set-ups quickly, easily and safely. Pre-set type is now economically possible. In just a few seconds, a spare type magazine with an all-new type set-up can be inserted into the marking head. Pre-setting type prevents costly down-time for changes.

The type magazine is made to accommodate lines of interchangeable characters positioned to your specifications. The type is held secure in the magazine by Pannier's sure-safe locks...spilling danger is eliminated.

Pannier engineers will be glad to consult with you on hot steel marking. For complete information, write

MASTER PANNIER MARKERS

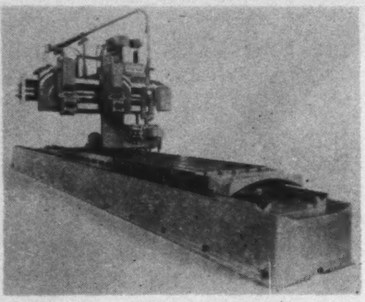
PANNIER MASTER MARKERS
206 Pannier Building, Pittsburgh 12, Pa.

diam., automatic Geneva motion-type indexing table. Table indexing time is 1.5 seconds, and fixture clamping and unclamping is completely automatic. The machine will accommodate a number of different size pistons. (H. R. Krueger & Co.)

For more data circle No. 86 on postcard, p. 177

Carbide Planer

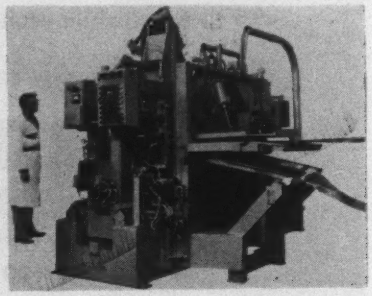
Designed for heavy-duty carbide planing, an openside planer substantially cuts setup and handling time for machine and component builders in many industries. The planer single cuts, double cuts and triple cuts. The planer's features include: simple control, non-metallic table ways, safety stop and table replacer, and loop lubrication. The planer also features square lock construction and full remote-control pendent station. (G. A. Gray Co.)



For more data circle No. 87 on postcard, p. 177

Joins Strip Coils

Joining strip ends together, for continuous processing in tinning, annealing and coil prep lines, a narrow-lap seam welder has many new features. These features speed the welding of thin gage steel strip

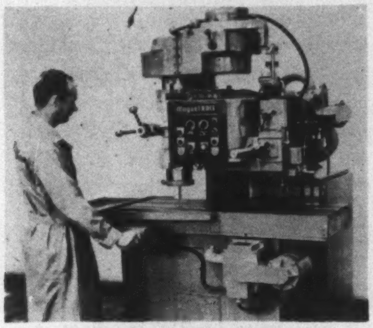


in building up large diameter coils. This welder is equipped with an automatic preloader for the head end of next coil. This feature allows the welder operator to load and prepare a coil for welding, as the previously joined coil is passing through the welder. Total time for strip handling, shearing, and welding is 15 seconds for a 46-in. strip. The machine can handle strip ranging in thickness from 0.004-0.036 in. (The Taylor Winfield Corp.)

For more data circle No. 88 on postcard, p. 177

Automatic Profiler

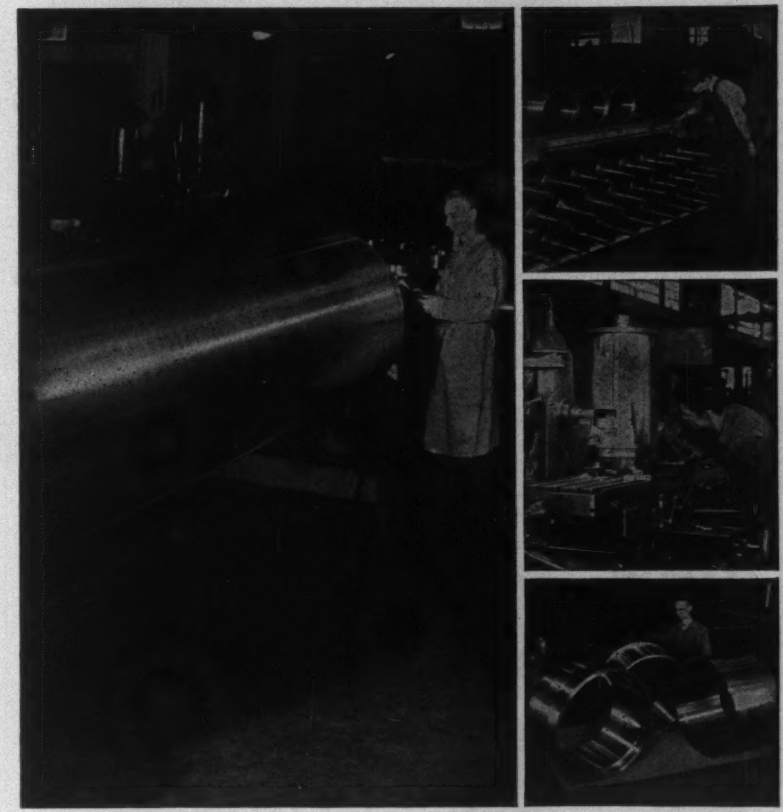
Designed and built from the base up, an automatic profiler does 360° profile milling under tracer control: The machine operates by following an easily prepared sheet-steel template, with an extremely sensitive tracer stylus, the same size as the milling cutter. Complex, irregular two-dimensional shapes can be reproduced with speeds and feeds and accuracy usually associated with precision plain milling operations. The machine is equipped with 5-hp spindle drive motor, with seven changes from 375-5200 rpm. Unusually fast metal removal, with better finishes and increased cutter life, are results of the powerful drive motor and the pre-set constant feed of the tracer along the template. (Pratt & Whitney Co., Inc.)



For more data circle No. 89 on postcard, p. 177

Blanks and Pierces

Eliminating finishing operations, a hydraulic press blanks most types of metal up to ¼ in., with smooth-edge accuracies. The accuracy ap-



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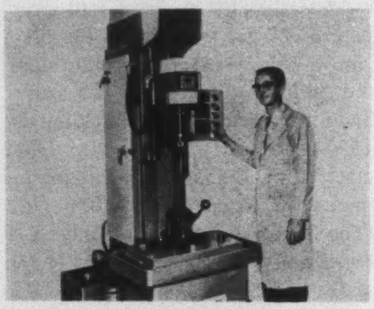
proaches tolerances normally associated with finish grinding. The triple-action hydraulic press operates a special die which controls the accuracy of the process. The blanking punch works against a bottom punch or die cushion. A third action clamps the material firmly during the blanking stroke. A smoother blanking action results, and parts are produced rapidly to surface accuracies within 0.0005 in. The press is completely automatic and all press actions are synchronized. (The Hydraulic Press Mfg. Co.)

For more data write No. 90 on postcard, p. 177

Honing Machine

For small diameter bores, a honing machine has a 12-in. stroke and a 12-in. swing. It will hone bores up to 2-in. diam at maximum stroke. A sizing mechanism maintains size consistency within 0.002 in. from bore to bore on this honer. Operating controls are mounted at shoulder height, and setup controls are protected by a locked cover to avoid undesirable changes once the setup has been made. (Barnes Drill Co.)



For more data write No. 91 on postcard, p. 177

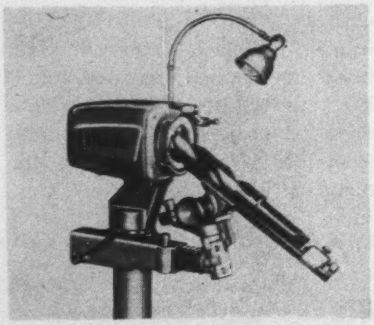
Precision Balances

General-purpose, high-speed precision balances, designed for small capacity industrial weighing operations of all types, comes in three capacities. They are: 800 g with 1/10-g graduations—2000 g with 1-g graduations—and 4000 g with 1-g graduations. Dials reading in pounds, grains or pennyweights can also be provided. Weight readings are indicated with a shadow-edge light projection on a large, direct-reading illuminated dial. (The Exact Weight Scale Co.)

For more data write No. 92 on postcard, p. 177

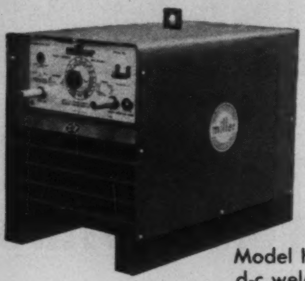
Drill Grinder

Grinding 59° drills accurately, with a free-cutting conical form on all sizes from ⅛-2½-in. diam, can be done quickly and easily on a drill grinder. Because no chucks or collets are required to hold the drills, it takes a minimum of time



two new compacts from miller

Model M-295 a-c welder


Model H-3-SR d-c welder

Wide range Miller M-295 a-c welder packs a lot of versatility in its compact 25" x 19" x 28" case. What's more, it's a genuinely low-cost 40 volt 200 ampere industrial welder that doesn't pretend to be all things to all men. Rather, it offers typical Miller sturdiness and reliability in a 60% duty cycle machine that's ideal for general maintenance and light production welding. Welding amperage ranges are 25-115 and 80-295. Power factor correction available as option.

SILVER STAR MODEL

Outsized performance has been built into this "inside" welder. Designed expressly to deliver the best in d-c welding at the lowest possible cost, the brand new Miller Silver Star performs on a par with the world's best (Miller's Gold Star SRH) but is less weather-resistant. If your d-c welding is done under a roof, then you'll want to know more about the Miller Silver Star, and the economies it offers. Two sizes available: H-3-SR with amperage ranges of 40-295 and 75-450; and H-4-SR with ratings of 50-350 and 100-600.

Complete information will be sent promptly upon request. Please specify model in which you're interested.

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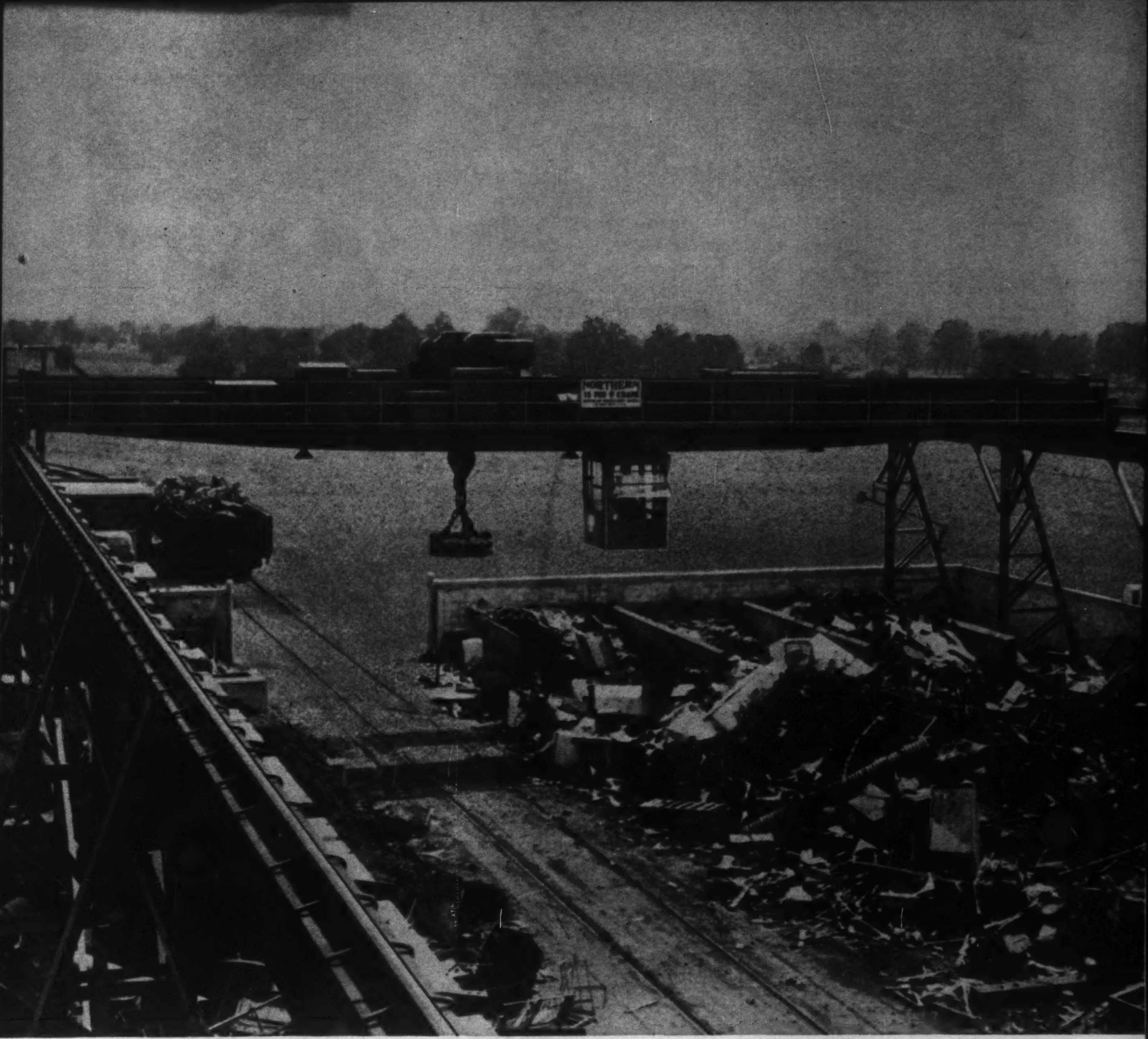

NORTHERN Cranes for salvage yard handling

These magnet handling, heavy duty Northern yard cranes handle scrap continuously in many scrap yards, foundries, steel mills and industrial plants.

NORTHERN CRANES — in this and many similar installations — assure: (1) higher operating speeds for faster turnover of salvage materials as related to yard space; (2) dependable, continuous operation with minimum service and maintenance because of heaviest duty type fittings and equipment; (3) safer, more effective crane operation because of better visibility from Northern's Clear Vision Control Cab; and (4) lower cost operation because oil bath lubrication minimizes crane idle time and wear in load bearing parts.

This 15-ton, 80-foot span, magnet handling crane has A.C., full magnetic, counter torque lowering with motor generator set mounted on crane footwalk.

MATERIAL HANDLING EQUIPMENT BY NORTHERN

Sales representatives in all principal cities.

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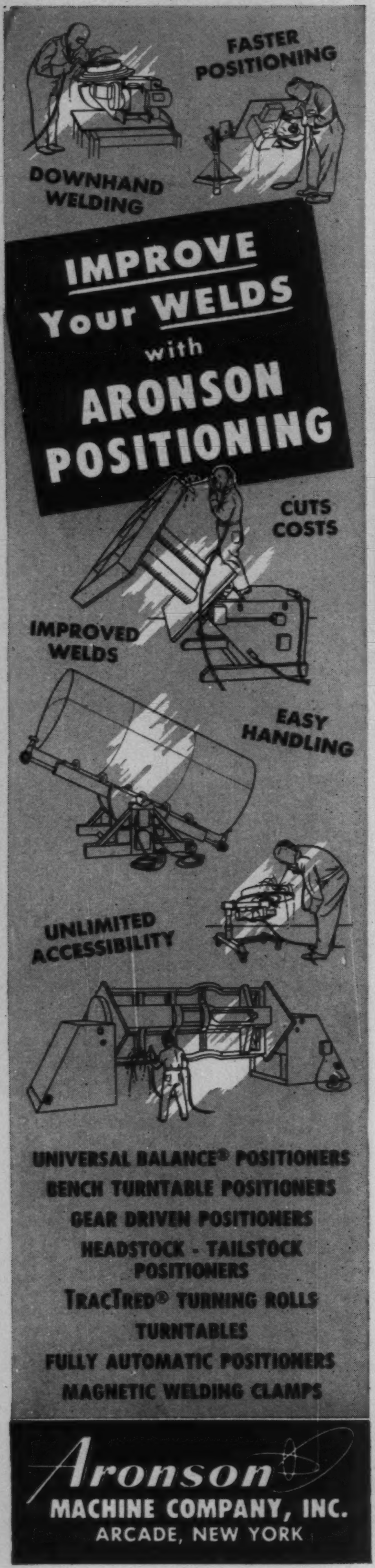

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MAGNETIC WELDING CLAMPS

Aronson
MACHINE COMPANY, INC.
ARCADE, NEW YORK

to change setups for various sizes. Locating the drill at the cutting edge of the lip being ground, produces an accurately centered drill that holds hole size to close tolerance (McDonough Mfg. Co.)

For more data write No. 93 on postcard, p. 177

Strapping Tensioners

Two new strapping tensioners, apply the principle of the self-energized feed wheel to manual heavy-duty strapping operations. High speed strap take-up of the heavy-duty tensioners, teamed with the unlimited take-up of feed wheel tools and the flexibility of manual strapping, make the new series basic to operations which do not lend themselves to stationary or semi-stationary strapping stations. (Signode Steel Strapping Co.)

For more data write No. 94 on postcard, p. 177

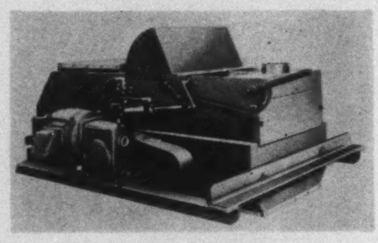
Rolls Thin Strip

High-precision rolling of thin-gage ferrous and non-ferrous strip, with accurate front and back tension control, is possible with a compact, low-cost 2-high/4-high combination mill. The reversing, cold reduction mill facility handles up to 6-in. wide strip at rolling speeds up to 250 fpm. It occupies only 35 sq ft of floor space. (Loma Machine Mfg Co., Inc.)

For more data write No. 95 on postcard, p. 177

Conveyor Feeders

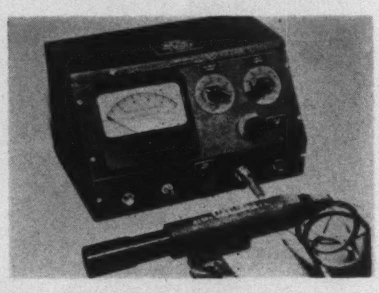
For hard-to-handle materials, conveyor feeders accurately feed the larger sizes of flaked, fibrous and similar materials ranging up to 1½-in. diam. The feeders are two-speed, single conveyor-belt units. Two control gates regulate feed flow rate. The first, a metering gate, controls the bulk material being fed to the belt. The second, a dribble control gate, suspended above the belt, controls the material flow from the belt to containers. (Thayer Scale Corp.)

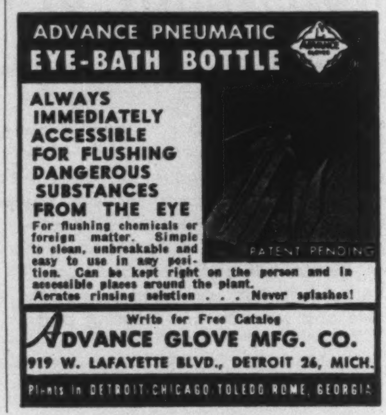


For more data write No. 96 on postcard, p. 177

Optical Lens Bench

Because of its unusual design, an optical lens bench is extremely sturdy and rigid. It can support heavy lenses or other optical components with virtually no deflection. The device is also relatively insensitive to vibration. Accurate alignment is maintained through machining from a common reference surface. Each slider may be removed or placed on the bars at any time, making for convenient and rapid





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EYE-BATH BOTTLE

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For flushing chemicals or foreign matter. Simple to clean, unbreakable and easy to use in any position. Can be kept right on the person and in accessible places around the plant. Aerates rinsing solution . . . Never splashes!

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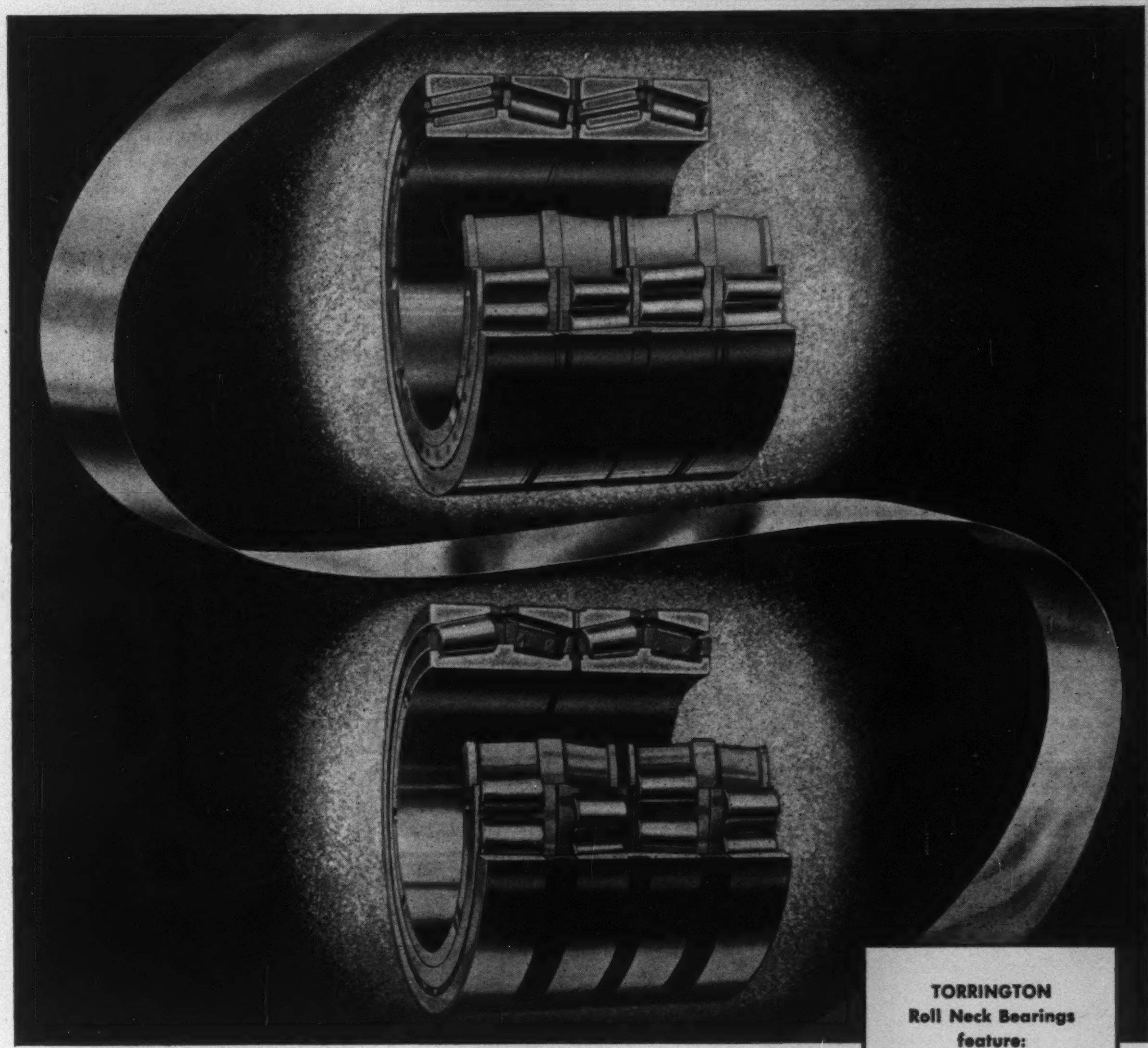

TORRINGTON
Roll Neck Bearings
feature:

- carburizing grade alloy steels
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- resistance to shock loads
- precision manufacture
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Keep tonnage rolling . . .
with Torrington Roll Neck Bearings

Tonnage rolled per turn and downtime saved—these measure bearing performance in metal rolling mills.

Torrington Roll Neck Bearings are designed for top performance under tough conditions. Maximum capacity and exceptional life expectancy are combined in bearings that operate efficiently under the severest thrust and radial loads. Torrington's advanced heat treating of carburizing-grade steels provides optimum resistance to wear and shock loads. Lubricant grooves on cone faces minimize roll neck galling under creep conditions.

When you choose Torrington Roll Neck Bearings you can be sure they will pay off in more steel production at lower cost. More than a quarter century of experience in anti-friction bearing engineering for metal rolling mills—makes Torrington quality a byword in the industry.

progress through precision **TORRINGTON BEARINGS**

THE TORRINGTON COMPANY South Bend 21, Indiana • Torrington, Conn.

This advertisement is neither an offer to sell nor a solicitation of offers to buy any of these securities. The offering is made only by the Prospectus.

NEW ISSUE August 31, 1960

$125,000,000

Republic Steel Corporation

4⅜% Sinking Fund Debentures Due 1985

Dated September 1, 1960 Due September 1, 1985

Price 99% and accrued interest

Copies of the Prospectus may be obtained from any of the several underwriters, including the undersigned, only in States in which such underwriters are qualified to act as dealers in securities and in which the Prospectus may legally be distributed.

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Merrill Lynch, Pierce, Fenner & Smith Incorporated
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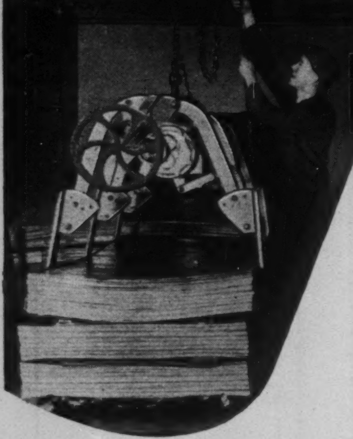
1 man ...handles Sheet Steel Faster, Easier with a C-F LIFTER



C-F Lifters, under one man operation, pick up, carry and unload more sheet steel tonnage per hour than any other method – and at lower cost per ton. Wide carrying angles hold sheets securely – won't damage high grade sheets; tong action insures safe carrying; fast opening and closing adjustments of Lifter jaws permit shifting from one size pack to another in seconds. C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons.

Write for Bulletin SL-28 for specific examples of C-F Lifter operation and economy.

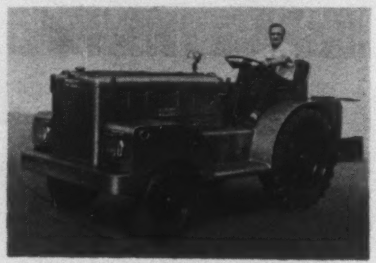
CULLEN-FRIESTEDT CO.
1303 SOUTH KILBOURN AVENUE • CHICAGO 23, ILLINOIS

experimental setups. Kinematic design makes for easy unconstrained and accurate alignment at all times. (Mason Instrument Co.)

For more data write No. 97 on postcard, p. 177

Mobile Welder

Self-contained and self-propelled, a welding unit has an engine directly coupled to the generator. The unit provides a mobile welding unit for installations in which welding applications occur at widely separate points. By traveling directly to the job and being ready to weld without waiting for electricians to hook up power lines, the unit saves hours of time. (Hobart Bros. Co.)



For more data write No. 98 on postcard, p. 177

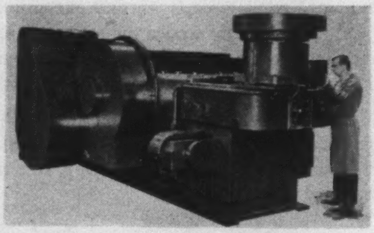
Aging Oven

Age acceleration simulates results ordinarily taking many years to produce. Mechanical convection, horizontal airflow aging ovens are ideal for accelerated aging, at controlled temperatures, of rubber, plastics, insulation, varnishes and paints. (Blue M Electric Co.)

For more data write No. 99 on postcard, p. 177

Extrudes Cans

At the rate of 120 per minute, a 300-ton press extrudes seamless aluminum cans. The press delivers the cans in an oriented manner ready for trimming, flanging, cleaning, coating, filling, and closing.



The cans, which start as disks ⅛-in. thick and 2½-in. diam, have a height of over 5 in. as they emerge from the machine. (The National Machinery Co.)

For more data write No. 100 on postcard, p. 177

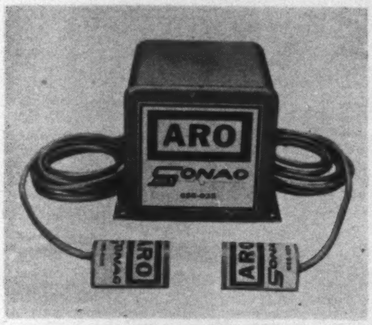
Identifies Steel Stock

Pressure-sensitive labels keep steel stocks identified without the mess and bother of paint. The label has a permanent type adhesive that, once put in place, is almost impossible to remove. Peeling off the protective backing paper and pressing the label into position, is the entire application method. These color coding labels come in a variety of shapes and colors. (Allen Hollander Co., Inc).

For more data write No. 101 on postcard, p. 177

Control and Switch

Operating accurately and efficiently, an automatic control and switching device uses beams of ultrasonic sound waves to count, control or monitor. The device is recommended for such diverse jobs as automatic counting, weighing, sizing, package routing, positioning, and many other production-line operations. In addition to service on the production line, it is also used for automatic industrial door and elevator control and for burglary protection. (Aro Equipment Corp.)



For more data write No. 102 on postcard, p. 177

Penetrating Lubricant

Anti-rust and anti-corrosive, a penetrating lubricant has good creeping ability, due to molecular interfacing action. It is non-flammable, non-toxic, harmless to the skin

ARMSTRONG

TOOL HOLDERS

A Correct Tool for Every Lathe Operation

You can save time (and money) by ensuring that your machine tools are equipped with *adequate numbers* of the correct ARMSTRONG Tool Holders. The ARMSTRONG System of Tool Holders includes correctly designed tools for *every* standard operation on lathes, shapers, and planers, and for many operations on turret lathes and screw machines. By utilizing the ARMSTRONG System of Tool Holders, you can reduce tooling costs, eliminate down time in tooling up, operate your machine tools at maximum feeds and speeds.

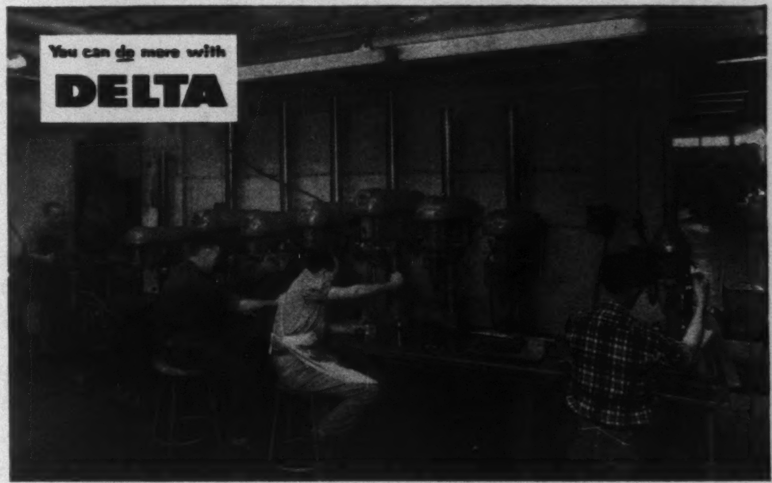
ARMSTRONG Tool Holders are long-lasting tools. They are strong beyond need, handy and efficient, profitable to use, and are readily available from your local ARMSTRONG distributor.

Check over your ARMSTRONG Tool Holder Needs. Write for literature.

If you do not know the name of your local ARMSTRONG Distributor, inquire when asking for literature.

ARMSTRONG BROS. TOOL CO.

5209 W. ARMSTRONG AVE.
CHICAGO 46, ILL.



"Workhorses" for precision drilling

Nine standard Delta drill presses do small lot precision work at the Armaments Division of Universal Match Company, St. Louis. Regular and power feed 20" drill presses, 17" models and the 14" Super-High Sensitive drill press are used in set-ups that suit the tool to the work. By exploiting the adaptability of these versatile tools, Universal gets far more productivity and quality than the low cost would indicate is possible. This is typical of the way accurate, rugged Delta Industrial Tools are being used to supplement or replace costly conventional tooling. For free booklet of cost cutting ideas, write: Rockwell Manufacturing Company, Delta Power Tool Division, 640J N. Lexington Ave., Pittsburgh 8, Pa. In Canada: Rockwell Manufacturing Company of Canada, Ltd., Guelph, Ontario.

G.O.CARLSON Inc.

If you use stainless steel plate

this new booklet on Carlson services in stainless steel gives you worthwhile facts!

THIS new Carlson Booklet, "Producing Stainless Steels . . . Exclusively," documents a unique, specialized service. Fully illustrated, it includes detailed sections on stainless steel plates, heads, forgings, special shapes, and other stainless products manufactured by Carlson.

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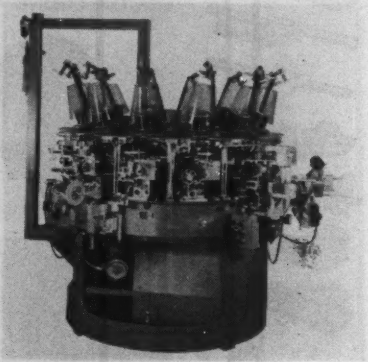
and safe even in an open cut. It makes the toughest dismantling job easy. The penetrant safely and efficiently removes rusted and corroded parts by finding its way instantly between contacts. (Lloyds Laboratories of America)

For more data write No. 103 on postcard, p. 177

Coil-Winding Machine

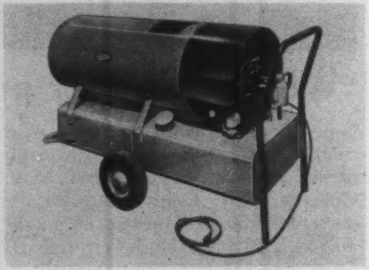


Cutting labor costs in half, a bobbin, coil-winding machine winds twelve coils at once. It winds them all in different sizes and wire gages if you choose. One operator can handle all twelve operations. Operation requires 220/440 v, 60-cycle, 3-phase current. (Crown Tool, Inc.)

For more data write No. 104 on postcard, p. 177

Oil-Fired Heaters

Oil-fired heaters, available in 125,000, 250,000 and 500,000 btu, feature stainless steel combustion chambers. All sizes are portable on wheels. They have positive displacement fuel pumps and are equipped with fuel filters as standard equipment. Thermostats are standard on two larger sizes. Fuel tanks are all of sufficient size to run the heater for 16 hours. (Aeroil Products Co., Inc.)



For more data write No. 105 on postcard, p. 177

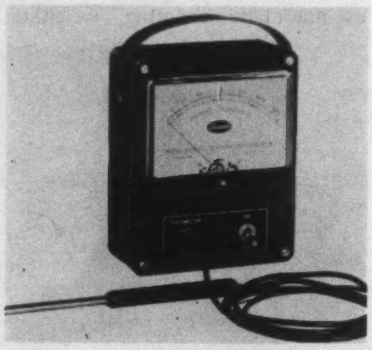
Dust Collectors

Improvement of a series of dust collectors gives more efficient dust separation. Modification of the stack and the addition of an air control disk, increases the flow of air through the cyclone separator. The series is used where large volumes of air are required. It services up to eleven machines, and is basically an outside vented type collector. With the addition of a filter house, it is easily converted into a recirculating collector. (Aget Mfg. Co.)

For more data write No. 106 on postcard, p. 177

Temperature Indicator

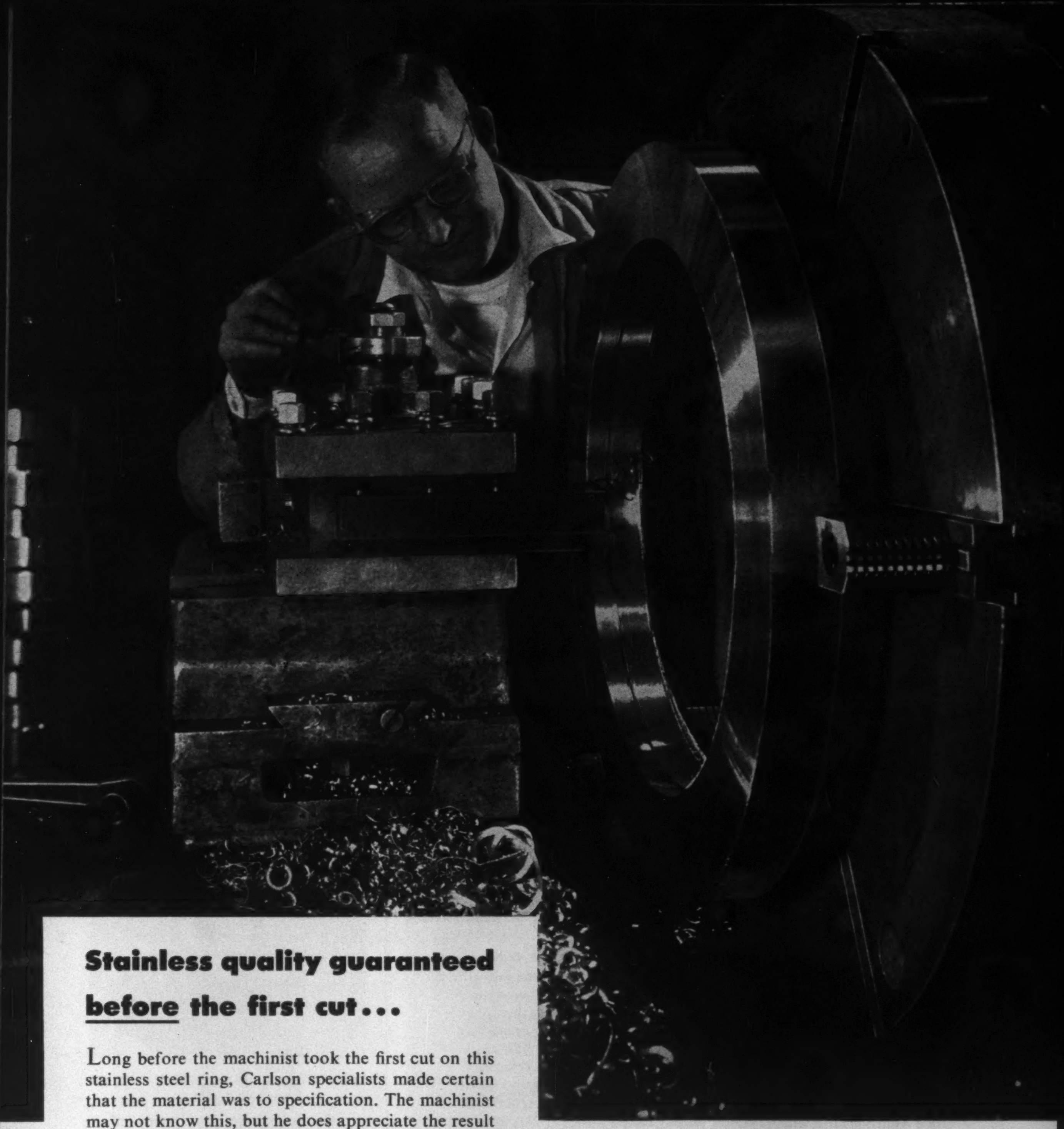
Battery powered, a portable temperature indicator has many applications for steam-generating plants, consulting engineers, and general industry. The unit has thermistor sensing probes and batteries having an estimated life of several thousand hours. It is available in ten different ranges, spanning —30 to +350°F. The indicator uses interchangeable probes for air, liquid and surface temperature sensing. (Fenwal Inc.)



For more data write No. 107 on postcard, p. 177

Rotary Drill

All-electric, a rotary drill is specifically engineered for blast-furnace use. Operated by push-button controls, it permits one man to drill the iron notch, including penetration of the skull, from the same protected pulpit area where the clay gun con-



Stainless quality guaranteed
before the first cut...

Long before the machinist took the first cut on this stainless steel ring, Carlson specialists made certain that the material was to specification. The machinist may not know this, but he does appreciate the result—the ease of machining to meet the most exacting requirements.

Whether you want rectangular stainless plates, pattern-cut special shapes, or machined products, you will save fabricating time by making full use of Carlson services. Fabricators of chemical, process, nuclear, aircraft and missile equipment recognize the advantages of these services.

Our specialists will be glad to work with you in producing just what you want, delivered on time. Telephone, write or wire for action.

G.O.CARLSON *Inc.*
Producers of Stainless Steel
120 Marshallton Road
THORNDALE, PENNSYLVANIA
District Sales Offices in Principal Cities

Plates • Plate Products • Heads • Rings • Circles • Flanges • Forgings • Bars and Sheets (No. 1 Finish)

trols are located. It swings on a pedestal mounting in a single sweeping motion to automatically position for an accurate tap hole. It then drills forward at a fixed rate of speed without clogging, stalling or lunging through weak areas. Air pressure, directed through the hollow drill rod, starts as drill is positioned; cleans cuttings from hole, cools drill bit, holds back metal flow, and signals operator. (Joy Mfg. Co.)

For more data write No. 108 on postcard, p. 177

Power Source

A new balanced wave, transformer-type power source, for use with tungsten arcwelding equipment, is very good for welding aluminum and magnesium, using alternating current. Some features of the machine include capacitor balancing; high open circuit voltage (165 v) for maximum arc stability; five broad overlapping ranges for applications requiring 20-400 amp; good wave form in all ranges. (Air Reduction Sales Co.)

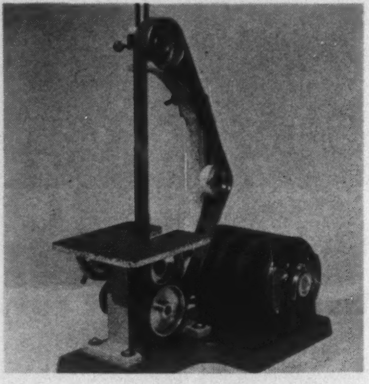
For more data write No. 109 on postcard, p. 177

Dry-Film Lubricant

Aerosol-applied, a multi-purpose dry-film lubricant is a colloidal form of Teflon, dispensed by a Freon propellant. It lays down a smooth, quick-drying, almost frictionless film of Teflon—preventing galling, freezing or abrasion of adjacent surfaces. The lubricant is non-greasy, does not drip or cake and provides a surface with the lowest coefficient of friction of any solid material. It can be used continuously at temperatures as high as 600°F, or as low as the cryogenic range. (Chemplast Inc.)

For more data write No. 110 on postcard, p. 177

Belt Grinder



A low-cost, portable abrasive belt machine light grinds and finishes wood, plastic, and metal. The sander deburrs, removes seams, and polishes small parts fast and economically. It affords clean cuts on many types of surfaces, curves, scrolls and inside edges with minimum equipment, time and effort. (The Rofran Co.)

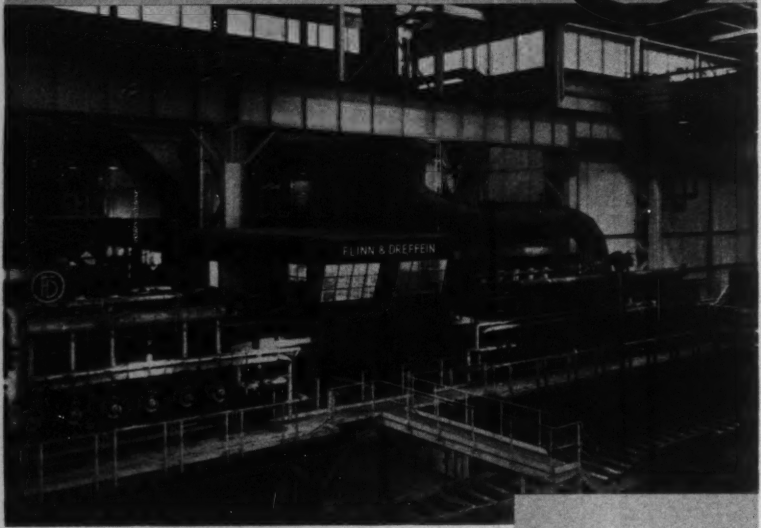
For more data write No. 111 on postcard, p. 177

Sheet Surfacer

Sheet surfacing operations ranging from cleaning and preparing metals for drawing to graining and polishing practically any sheet ma-

. . . another first by Flinn & Dreffein . . .

FD



Two new "Flinn & Dreffein Designed" 5-zone reheat furnaces made news recently when they were placed in operation at the new structural mill of United States Steel Corporation's South Works plant at Chicago.

The demand for larger sections, tonnage capacities and flexibility of heating operation dictated this advanced design.

Once again, Flinn and Dreffein experience and know-how reflected by user's confidence inspired Flinn and Dreffein engineers to further the development of reheat furnaces using the latest techniques and materials in furnace design.

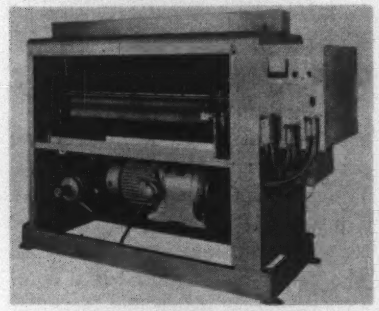
F & D Furnaces . . . for more than half-a-century . . .

ANNEALING
CARBURIZING
DRAWING
FORGING
GALVANIZING
HARDENING
HEAT TREATING
NORMALIZING
REHEATING
ROTARY
SLAB HEATERS

Gas and oil fired or electrically heated.

FLINN & DREFFEIN ENGINEERING CO.
36 S. Wabash Ave., Chicago 3, Ill.

terial can be done fast and efficiently on an oscillating sheet surfacer. The machine employs abrasive impregnated nylon, mounted on an oscillating arbor which is adjustable to oscillate from 0-400 times per minute. The workhead drive can be equipped for single or variable speed. The feed rolls are equipped with variable-speed drive. (Sales Service Mfg. Co.)



For more data write No. 112 on postcard, p. 177

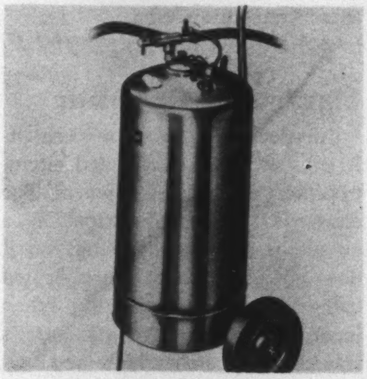
Finishing Machine

A finishing machine produces a finish equal or superior to buffing on parts with intricate detail, ornamentation, or complex shape. Using a fine loose abrasive, the machine utilizes a high centrifugal force which holds parts and media together in a tight mass. Processing time is short. No fixtures or buffs are necessary. (The Roto-Finish Co.)

For more data write No. 113 on postcard, p. 177

Sprays Solutions

For spraying cleaning solutions onto equipment, walls, floors, and difficult-to-clean areas in industrial plants, a stainless steel apparatus holds and mixes 10 gal. of detergent at predetermined concentration into hot water pressure lines. It produces up to 1600 gal of cleaning solution. (DuBois Chemicals, Inc.)



For more data write No. 114 on postcard, p. 177

Scribes Metal

A pocket-size edge-scriber marks lines on sheet metal, at a predetermined distance from the edge. The edge-scriber is made of hard 16-gage, plated steel. It is calibrated in dimensions of ⅛, 3/16, ¼, 5/16, ⅜, ½, ⅝ and ¾ in. (Duro-Dyne Corp.)

For more data write No. 115 on postcard, p. 177

Gun Drills Long Holes

Holes, ranging up to 60 in. in length and 3 in. in diam, can be drilled with a gun-drilling and boring power unit. These holes can be gun-drilled from the solid—in one pass—on a production schedule. The ability of the unit to consistent-

Here's the
PHOSPHATE COATING
You asked **TURCO TO MAKE**

HERE'S HOW **PAINTITE** SCORES ON SURVEY'S 12 "MOST WANTED" FEATURES...

–Formulated as Result of Industry-Wide Survey...

During the first six months of 1959, Turco undertook an extensive survey of the phosphate coating market. Hundreds of users of these coatings were interviewed. Thousands of questions were asked. When the answers were tabulated, Turco began the task of building an iron phosphate process to the *exact specifications* called out in the survey.

The new process is now available. It is called Turco Paintite. Paintite has been thoroughly field-tested in the production lines of a dozen Turco customers. It has passed the most severe tests with flying colors. Turco is proud to announce the addition of Paintite to its ten other Turcoat phosphate and conversion coating processes that provide a better bond for organic finishing.

1. **SUPERIOR CLEANING**–Exclusive wetting system provides heavy-duty uniform cleaning. Cleans & phosphates simultaneously.
2. **TEMPERATURE VERSATILITY** – Efficient anywhere within range of 140° to 180°F. Temperature control is not important.
3. **LOW FOAMING** – at any temperature within recommended range.
4. **LESS POST RUST**–Eliminates post rusting problem often encountered with iron phosphate processes.
5. **NO WHITE STREAKING**–Extra free rinsing. Leaves no residue.
6. **ECONOMICAL**–Low in initial cost. Low in maintenance cost. Low in cost per sq. ft. Long-lived, even under mass production use.
7. **UNIFORM COATING**–even on edges and points. Won't show through on low-pigmented paints.
8. **USE VERSATILITY**–used by immersion, spray washer or steam cleaner.
9. **LESS SLUDGE** – less scale. Minimizes clean-up problems.
10. **RESERVE ACIDITY**–combats alkaline water conditions. Constant control not necessary.
11. **SUPERIOR SERVICE**–by Turco's vast network of technically trained servicemen, located in industrial centers throughout the world.
12. **REQUIRES ONLY 3 STAGES**–for dip or spray washing. Can be efficiently used in 5-stage operations, if desired.

FREE! VALUABLE BOOKLET
PHOSPHATING REFERENCE CHART
TECHNICAL DATA BULLETIN

Get the full story on Paintite and the other ten phosphating and conversion coating processes in the complete Turcoat line. Write for your copy, along with Turco's Phosphating Reference Chart, today!

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Chemical Processing Compounds
24600 South Main Street, Wilmington, California
FACTORIES: Rockdale, Ill., Houston, Wilmington, London, Rotterdam, Sydney, Mexico City, Paris, Hamburg, Montreal, Manila, Naha (Okinawa)
Offices in All Principal Cities

TURCO PRODUCTS, INC.
24600 South Main St., Wilmington, Calif.

MERELY AFFIX COUPON TO COMPANY LETTERHEAD

Please send valuable booklet with Phosphating Reference Chart and full details on Paintite. I understand there is no cost or obligation on my part.

NAME
TITLE

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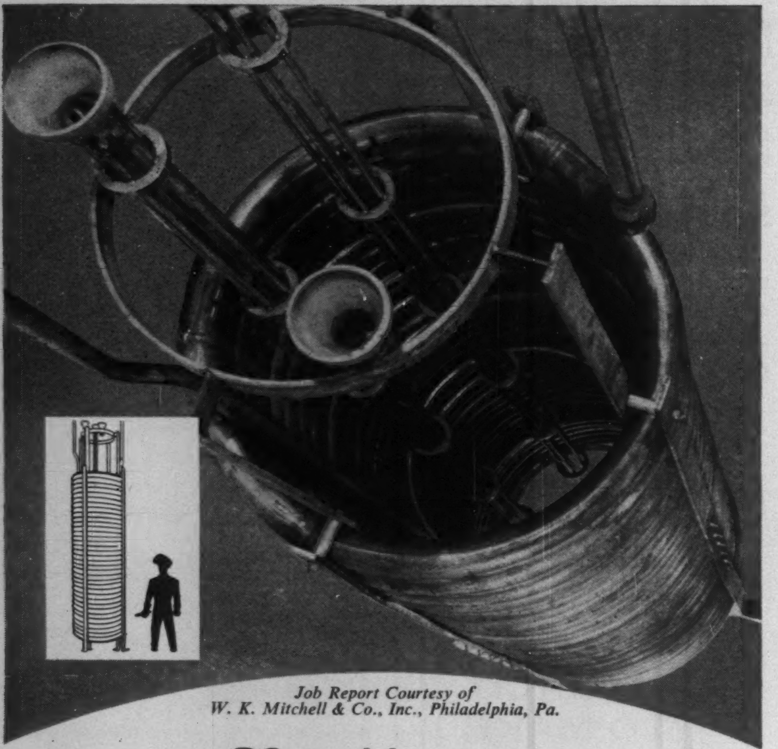


Job Report Courtesy of
W. K. Mitchell & Co., Inc., Philadelphia, Pa.

30 welds meet severe bending with no failures

Over 260' of Type 304L stainless tubing (3½" O.D. x 0.300" thick) was welded to form this coil assembly 17' high, 4' O.D. The job originally called for 10 welds. But because the fabricator had to accept random length tubing, 30 welds were required. Arcos Chromenar KLC Electrodes were used to assure needed corrosion resistance and high ductility. All welds met the bend perfectly.

WELD WITH ARCOS

STAINLESS ELECTRODES

for quality weld metal

ELECTRODES • WIRE • FLUXES
SEMI-AUTOMATIC AND AUTOMATIC EQUIPMENT FOR WELDING
STAINLESS • LOW ALLOY • ALUMINUM • MILD STEEL

ARCOS CORPORATION • 1500 South 50th St., Philadelphia 43, Pa

ly produce high-quality holes eliminates such operations as pilot drilling, reaming and honing. (Drillmation Co.)

For more data write No. 116 on postcard, p. 177

Gas Density Balance

A continuous, gas density balance is used in applications where process stream density is critical. The gas density balance consists of a measuring cell, amplifier, power supply and temperature controls. The "balance" is housed in a compact steel case which can be either wall- or panel-mounted. Features of the instrument include rapid response to changes in density, corrosion resistance, positive accuracy check and single- or multiple-range linear meter readout. (Beckman Instruments, Inc.)

For more data write No. 117 on postcard, p. 177

Straightens and Cuts

An automatic straightening and cut-off machine facilitates the use of economical, easy-to-store coiled tubing. It permits volume users of nonferrous metal and plastic tubing to cut any length required from lower-cost coiled tubing. Waste which often occurs with straight tubing is practically eliminated. Less storage space is required. The standard machine cuts accurate lengths in any increment from 1/16 in. to 10 ft. Tubing can be cut up to rates of 5000 pieces per hour. (Precision Parts Co.)

For more data write No. 118 on postcard, p. 177

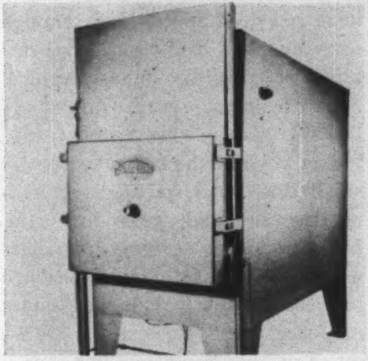
Electronic Crowbar

An electronic "crowbar" instantly prys away an overloaded circuit to protect expensive equipment. The electronic crowbar functions as a circuit breaker or thyratron, yet it does not use vacuum tubes, heated cathodes or moving parts. When incorporated in the manufacturer's standard and custom, high- and low-current systems, the simple circuitry provides a low-cost, protective device. It will operate within a few microseconds to protect both the power supply and critical loads from excessively high current surges. (Sorensen & Co., Inc.)

For more data write No. 119 on postcard, p. 177

Recirculating Furnace

A box recirculating furnace can be used for annealing, tempering and stress relieving of both ferrous and nonferrous alloys, in a wide operating temperature range of 300-1400°F. Both small and large parts may be heated together under accurate temperature control. A positive pressure, high volume fan insures rapid and uniform heating of the work being processed. (Sunbeam Equipment Corp.)



For more data write No. 120 on postcard, p. 177

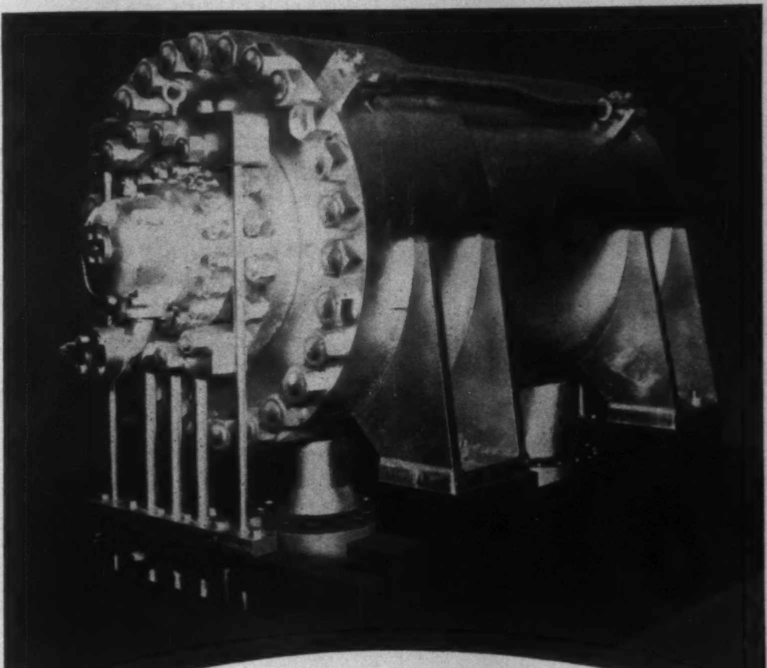
Intake Air Units

Gas-fired air intake units supply make-up air to replace that removed by exhaust systems. Four basic units give a capacity range of from 15,000 to 90,000 cfm (1,000,000 to 7,000,000 btu/hr.) The basic units include the burner, controls and belt or direct driven fan in a single housing. (Hartzell Propeller Fan Co.)

For more data write No. 121 on postcard, p. 177

Die Casting Machine

High-speed injection, die casting machines are suitable for all nonferrous alloy metals. They have interchangeability of their casting heads, offering two process setups in any particular case: for the cold-chamber method with either vertical or horizontal pressure chamber, or for the hot-chamber method. Selection



Job Report Courtesy of
Ingersoll-Rand Co., Phillipsburg, N. J.

When low alloy welds must withstand 2000 psi

This centrifugal compressor is one of many used in offshore gas repressuring. The pressure of nearly 2000 psi is nearly twice the highest former working pressure. Arcos Tensilend 70 Electrodes were used to produce the high strength welds required. When *you* need sound, high strength weld metal, use Arcos Low Alloy quality controlled electrodes for reliable performance.

WELD WITH ARCOS

LOW ALLOY ELECTRODES
for quality weld metal

ELECTRODES • WIRE • FLUXES
SEMI-AUTOMATIC AND AUTOMATIC EQUIPMENT FOR WELDING
STAINLESS • LOW ALLOY • ALUMINUM • MILD STEEL

ARCOS CORPORATION • 1500 South 50th St., Philadelphia 43, Pa.

O_2

AMERICAN MESSER

O_2

AMERICAN MESSER

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Messer

...... for air separation plants designed for steel mill applications, think *first* of American Messer.

AMERICAN MESSER CORPORATION
Chrysler Building, 405 Lexington Ave.
New York 17, N.Y.

is determined by the shape of the workpiece, material, and special technical requirements of the casting. (Eric P. Cahn)

For more data write No. 122 on postcard, p. 177

Epoxy Adhesive

An epoxy adhesive has a tensile shear of 2200 psi at 300°F on aluminum to aluminum. A smooth, thixotropic, 100-pct solids paste, it will not flow during cure—even when applied to vertical surfaces. It is ideally suited for bonding porous surfaces; also recommended for bonding metal, plastics, ceramics, glass and wood. (Hysol Corp.)

For more data write No. 123 on postcard, p. 177

Heat Exchangers

Complete with recirculating pump, heat-exchanger units are designed for heating or cooling acids or other liquids, in tanks having capacities up to 900 gal. The combination package heat exchanger and pumping unit is very compact, measuring about 28-in. long, 10 in. wide and 20 in. high. (Heil Process Equipment Corp.)

For more data write No. 124 on postcard, p. 177

Fork Truck

Capable of lifting 35 tons, a general-purpose lift truck is 12-ft high over the cab, 29-ft long (without forks), and 11-ft wide. Its four tires are 74-in. high. A six-foot tall man can stand upright under the rear deck of the machine. With construction-type pneumatic tires and four-wheel drive, the truck is designed for especially heavy lifting work at steel yards, steel erection sites, lumber mills and similar outdoor operations. (Clark Equipment Co.)

For more data write No. 125 on postcard, p. 126

High-Speed Lathe

A 16-in. lathe is designed specifically for high-speed turning, facing, and boring operations. Controls, feeds and speeds, and principles of design all are predicated on specialization — the machine has no gearbox or threading equipment. Operators require less skill and can turn out more and better work because a minimum of technique is required to operate the lathe. Speeds and feeds can be changed at any time simply by turning dials on the headstock. (Barber-Colman Co.)

For more data write No. 126 on postcard, p. 177

Multiple Drill Head

Designed for precision production of small parts, a multiple drill head provides speeds high enough for very small drills; on center distances as small as 3/8 in. The drill head features speed ranges of 0-8000 rpm. This speed range makes possible the use of extremely small drills. All spindles are ball-bearing mounted; gears are case-hardened; hole center tolerances are ±0.001 in. Maximum distance between centers is 3 in.; maximum drill size, #20. Case size is 2-, 3-, or 4-in. diam, depending upon particular requirements of individ-

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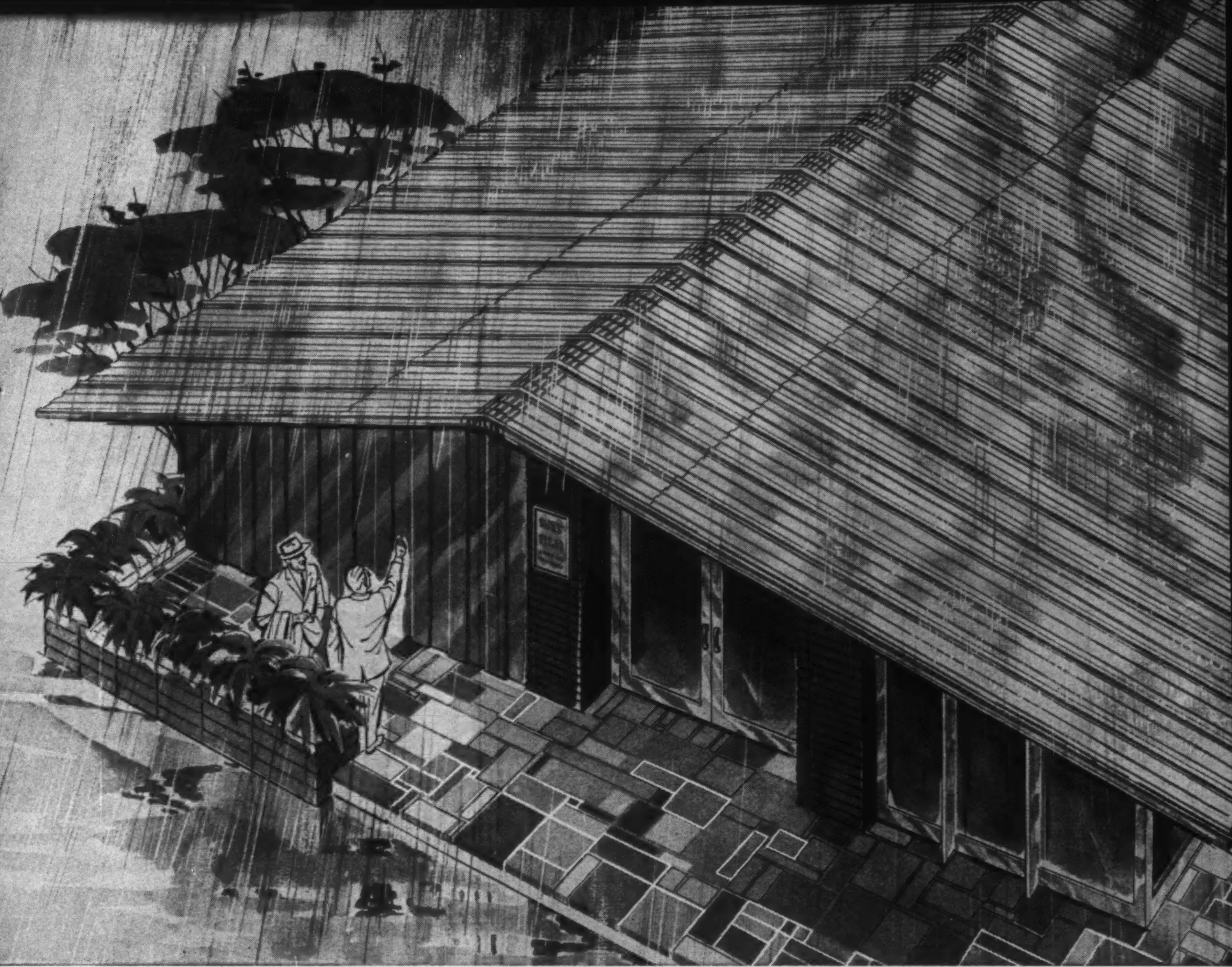

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Here's another reason to "go Butler" for your new building this year. You can have a preferred aluminum roof so superior that we are now able to offer a *20-year guarantee.*

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For your new building, take advantage of the wide, clear spans of Butler rigid frames . . . the beautiful new Butler-Tone™ baked-on color finishes for wall and roof panels . . . your choice of the finest factory-insulated or field-insulated exterior wall panels . . . the fast, trouble-free construction . . . and the dependable, talented services of the nationwide group of Butler Builders.

Interested? See your Yellow Pages for the name of your Butler Builder, under "Buildings" or "Steel Buildings." Ask about financing, too . . . or write direct.

"See Sweet's Industrial Construction File—Section 8-B"

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to
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GREATER PROFITS

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. . . increases profits . . . improves handling

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Literature on American Metal Turnings Crushers is yours for the asking.

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ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1439 MACKLIND AVE. ST. LOUIS 10, MO.

ual user. Each drill head is especially designed and built to user's production requirements. (Metron Instrument Co.)

For more data write No. 127 on postcard, p. 177

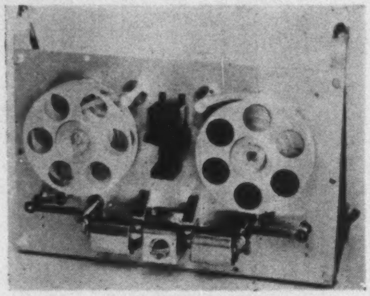
Cleans Castings

The new compensating flow-round separator is built for the toughest foundry sand loading conditions. It combines the design features necessary for complete purging of sand from an abrasive operating mixture, even when sand loadings approach or equal the weight of the castings being processed. (Wheelabrator Corp.)

For more data write No. 128 on postcard, p. 177

Punched-Tape Reader

A high-speed, punched tape reader is capable of stopping on character at the normal tape reading rate of more than 200 eight-bit characters per second. For use with computer-controlled systems, the unit reads characters on punched 1-in. Mylar or paper tape, with a tape capacity of 550 feet. Normal tape reading rate is 20 ips in both forward and reverse directions. The fast reading rate in both forward and reverse directions is about 1400 characters per second. (Westrex Corp., a div. of Litton Industries)



For more data write No. 129 on postcard, p. 177

Thread Gage

The pitch diameter of internal threads can be measured with high accuracy (0.0002 in.) with a universal thread gage. The extent of the error is directly readable. The gage can also be used as a maximum gage, adjustable to various tolerances; also as a maximum/minimum gage for stud bolt fits. Wear is compensated for by zero setting with a master ring. (Homestrand Machine Tool Corp.)

For more data write No. 130 on postcard, p. 177

Pneumatic Tapper

Two new models of portable tapping machines provide high-speed tapping of small holes. Both models operate on the "push-pull" principle, and withdraw from the tapped holes at double the speed of entry, to reduce the man-hours involved in tapping operations. Both models are available with quick-release chucks, for operations where frequent size changes of taps or stud setters are required. Both are light in weight (4½ lb) for ease in handling and reduced operator fatigue. (Newage Industries, Inc.)

For more data write No. 131 on postcard, p. 177

Lubricant Stick

Extreme - pressure molybdenum disulfide dry lubricant is resin bonded for greater strength. In the form of a stick, it permits easy application of a lubricating film to cutting and shaping tools, sliding areas of small and medium-size machine parts; or wherever metallic dry friction occurs on sliding surfaces. Application is simple. The stick is just rubbed firmly over the cleaned surface. (The Alpha-Molykote Corp.)

For more data write No. 132 on postcard, p. 177

Improves Ductility

A new method of forming tungsten has been developed that promises to expand the usefulness of this high-temperature metal as a structural material. Tungsten, which melts at 6170°F, is one of the most valuable high-temperature materials available. It retains most of its strength at temperatures as high as 4000°F. Because of its high-temperature characteristics, it has been extremely difficult to "work" into tough, non-brittle

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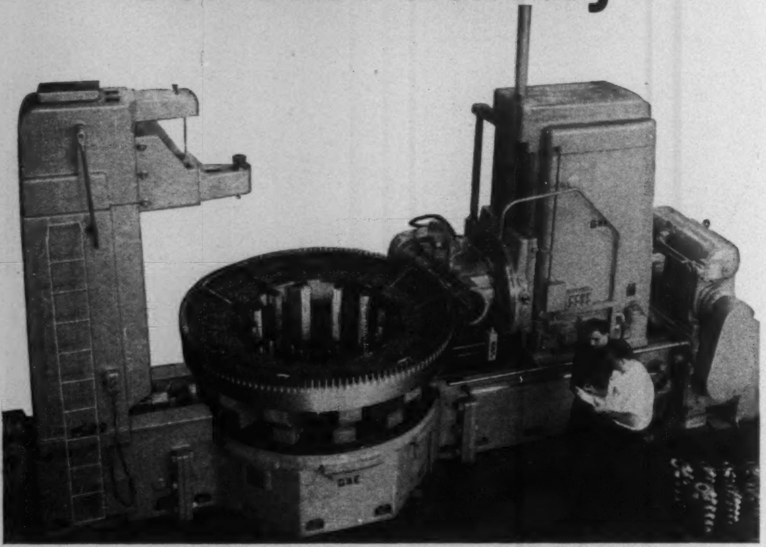

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Large Generated Gears

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for a wide range of industrial applications

Gears which must operate smoothly and without vibration at higher speeds and under greater loads must correspondingly be more accurate in tooth profile and spacing.

H & S Generated Gears answer these demands.

Offering the same high-quality standards which characterize the complete H & S Gear line, production capacities for large generated Spur, Helical and Hobbed-Herringbone Gears are now available in the following dimensions:

Up to 80″ outside diameter at 1 DP
Up to 90″ outside diameter at 1¼ DP
Up to 100″ outside diameter at 1½ DP
Up to 125″ outside diameter at 2 DP
Face widths up to 42″, depending on helix angle

Send your specifications, or let our technical staff make recommendations. H & S specializes in fast production of quality industrial Gearing and Speed Reducers to meet your custom requirements.

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AGMA

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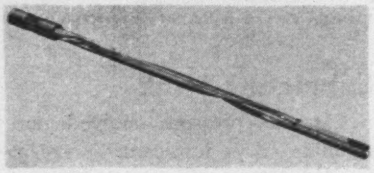
shapes capable of resisting sudden shocks or loads. This has restricted its use as a structural material. Tests conducted on high-velocity extruding and forging machines have indicated that if the metal is formed fast enough, extensive grain refinement occurs, with a striking improvement in the ductility of the metal and its consequent toughness. (Convair)

For more data write No. 133 on postcard, p. 177

Rotary Files

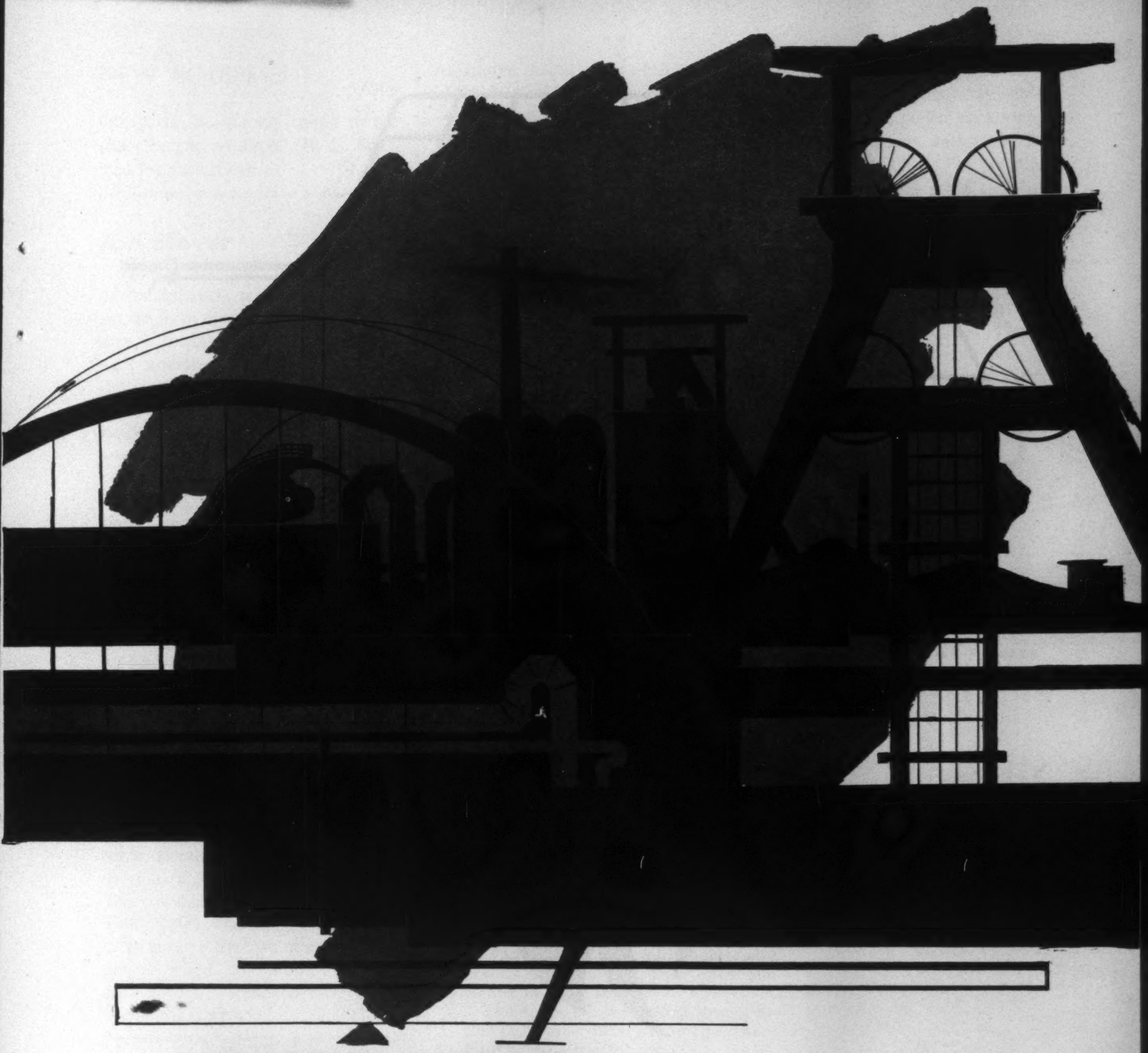
A new design feature for Tungsten-Carbide Rotary Files increases the efficiency and life-span of the rotary files to 25 times. It also greatly increases the range of applications of these tools. The files embody a special, second "trailing" edge. The edge is built into the length of each tooth, greatly increasing the overall strength of each flute. The result is much faster and smoother stock removal. The files give a relatively good finish. (Grobet File Co. of America, Inc.)



For more data write No. 134 on postcard, p. 177

Portable Gantry

The problem of handling heavy equipment in cramped spaces led to the design of a portable gantry. It adjusts height, spread and level. The gantry has telescoping legs with up to 6 ft of height adjustment, and a self-aligning I-Beam that can be safely loaded from off center. The trolley is free to travel the full length. Other features include swivel lock casters, spring-loaded bolts, and removable casters and caster frames. All parts are weather proofed. It can be set low for moving under overhead obstacles, and narrowed to under 4 ft for rolling through tight spaces. At the



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* Taken from Demag Publication „Engineering for Steel"

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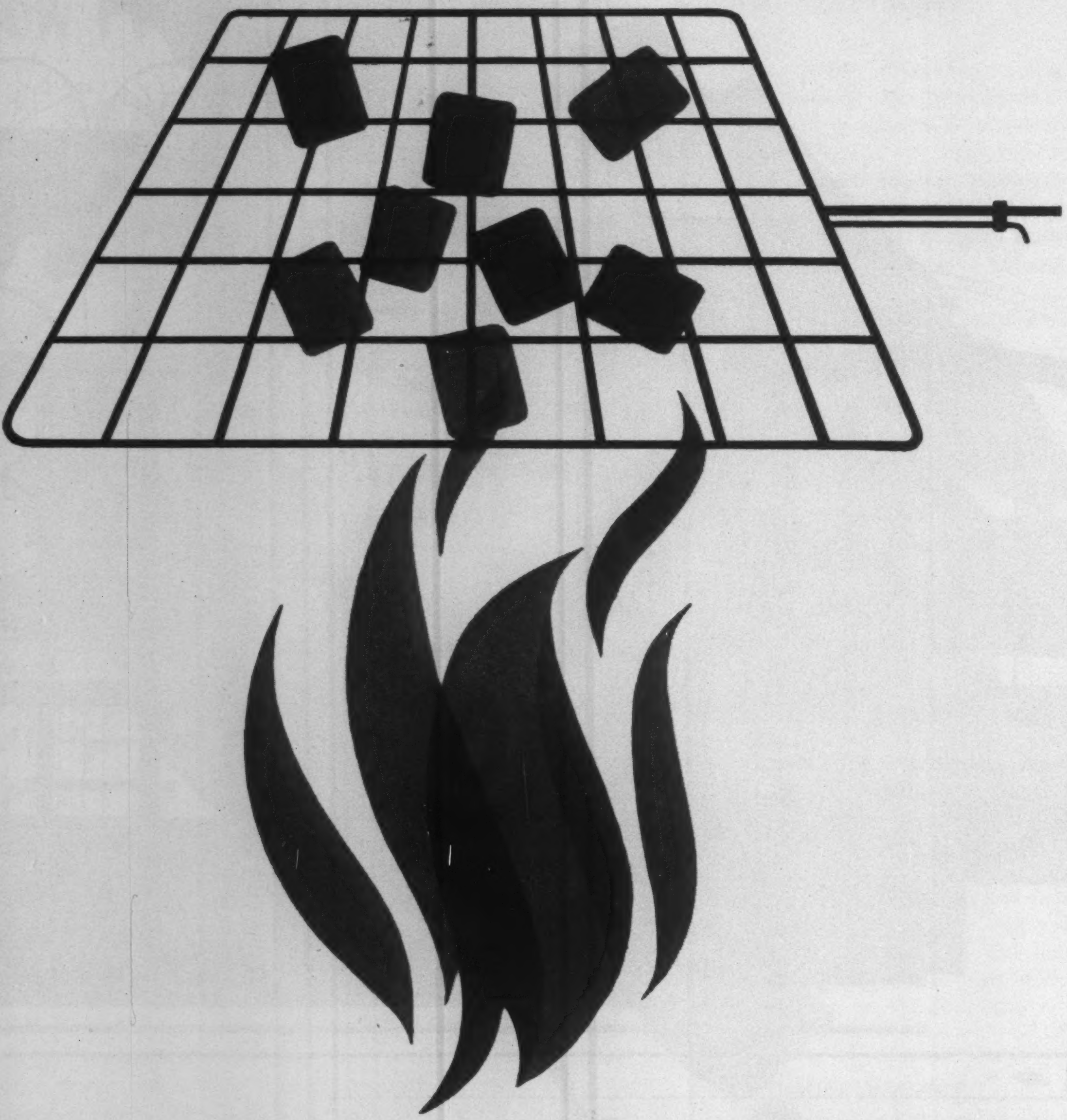

toasted nickel briquettes for low H_2 diet

Sherritt's recipe for making low-hydrogen nickel is as effective as it is simple: take pure nickel powder, press into uniform briquettes, and heat for a quarter of an hour at 1650°F. The result: pure nickel in its handiest form, with scarcely a trace of hydrogen. High-purity Sherritt nickel is also available in three standard grades of powder, special grades, and coated powders.

Foote Mineral Company *is the exclusive sales agent for Sherritt nickel and cobalt in the United States and Canada. For complete illustrated brochure with prices and delivery information, contact the Foote Mineral Company, 4385 Eighteen West Chelten Building, Philadelphia 44, Pa.*

SHERRITT GORDON MINES LIMITED

job, it can be quickly raised to the exact height required. (B. E. Wallace Products Corp.)

For more data write No. 135 on postcard, p. 177

Air Mover

Highly efficient, an air-moving device exhausts welding fumes and smoke from closed work areas. The unit is comprised of a special intake nozzle joined to a jet pump casting by a length of flexible tubing. From this point, smoke is exhausted through another connecting section of tubing to any discharge point. Operation requires merely connecting it to an air line positioned to carry the smoke and fumes away from the work area. By directing a current of air out, it draws fresh air into the work area. (Arcair Co.)

For more data write No. 136 on postcard, p. 177

Portable Saws

Two new models have been added to the manufacturer's family of air-powered portable saws. Following the 6½-in. blade model are the 8¼-in. and 12-in. models. An efficient governor-controlled air motor transmits high power and torque through a spiral bevel gear drive. The saws have operating speeds of 3000, 4800, and 6000 rpm. These saws may be used on masonry or on plastic, wood, aluminum, and other semi-hard nonferrous metals. (Buckeye Tools Corp.)

For more data write No. 137 on postcard, p. 177

Drum Dumper

Designed for low-cost movement, lifting and emptying of drum containers, all models of a drum-dumper line rotate the drum 180°, at any point in the lifting range. This variable-height dumping feature cuts costs by using one dumper to feed receiving hoppers of various heights. The drum dumpers can be completely powered for travel, grabbing, lift and dumping. One push button controls all the movements. The hydraulic turning device furnishes clean, fast pouring of liquids, and its double action allows full control of the rotating drum; it can pour fast or slow or it can be quickly stopped and reversed for partial pours. (Uhrden, Inc.)

For more data write No. 138 on postcard, p. 177

Lifts Thin Sheets

A lifting unit handles and places very thin stainless steel sheets on an insulating board. The new unit eliminates costly manual handling which produced crimping because of the lightness of material. This new lifting unit is entirely self-contained with the power pack mounted on a 48-in. beam, with three 20-in. crossarms attached. The six silicone pads have a total rated capacity of 300 lb with a 2:1 safety factor. Other features include push-button controls and a manual guide handle. The lift systems are currently used to handle materials from a few ounces to several tons. They are used extensively in handling steel

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TO SAVE MONEY

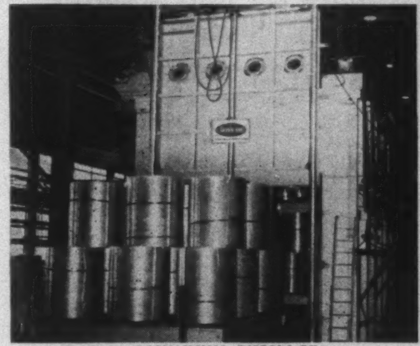
At Sunbeam there is no guess work or experimentation in recommending the furnace that will do your specific job best. We build a complete line of all types and sizes of furnace equipment and our engineers have experience with all materials and metals.

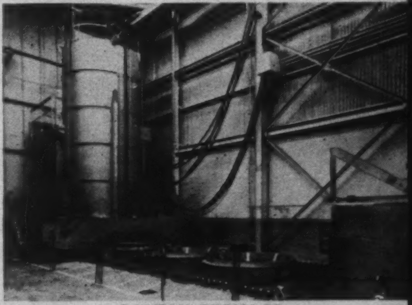
Your Sunbeam furnace will be designed and built with only your specifications in mind. The parts and material that go into the construction of your furnace are selected on the basis of your particular requirements . . . no more—no less.

That is why your Sunbeam furnace equipment will *cost less* to operate and maintain. It will perform more efficiently and last longer.

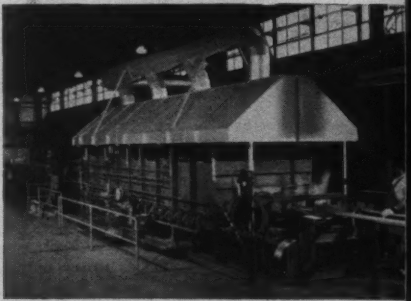
The furnace installations shown on this page are typical of the equipment built to do a specific job.

Whether you need a single furnace or an entire production line, be sure you have a quotation from Sunbeam before you buy.


ALUMINUM FURNACE
Atmosphere controlled heating and cooling of coil


GANTRY FURNACE
Has three different quenching mediums

GALVANIZING FURNACE
Handles tanks 6 feet long


CONTINUOUS FURNACE
Bright anneals stainless steel tubing

Sunbeam
the best industrial furnaces made

SUNBEAM EQUIPMENT CORPORATION
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plate, tanks, concrete, structural steel, glass, as well as many other nonporous materials. (The Siegler Corp.)

For more data write No. 139 on postcard, p. 177

Sheet Feeder

Hydraulically operated, on overarm feeder feeds sheets from a pile to processing or conveying equipment; or conversely, for piling sheets as they come from production. Sheets may range in size up to 6 x 20 ft, and a variety of materials may be handled—plastics, cardboard, metal, and asbestos board. The feeder grasps sheets by means of vacuum cups supported on a carrier which is mounted between two oscillating arms. The feeder handles rectangular or irregularly - shaped sheets, flat or formed sheets, and can pick up or deliver sheets vertically as well as horizontally. It requires floor space only slightly larger than the sheets being handled, has no elevator, stacks sheets in piles 30-in. high, does not mark the sheets, and is easily serviced since piles are alongside rather than under the machine. (The de Florez Co.)

For more data write No. 140 on postcard, p. 177

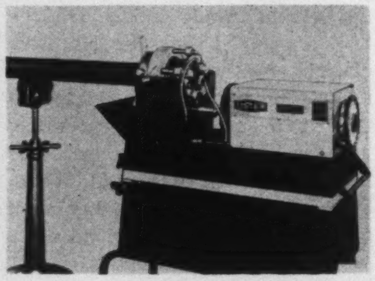
Sand Muller

Having a rated capacity of up to 400 lb, a sand muller is designed for batch mixing of sand with CO_2 binder, air-setting binders, resin binder, core oil and all other types of binders used in the production of sand cores and molds. Outstanding features of the new muller are: A low silhouette, it is compact, fast, rugged, and maintenance free (Frederick B. Stevens, Inc.)

For more data write No. 141 on postcard, p. 177

Threads Pipe

For threading up to 4-in pipe, a geared, die-stock adaptation was designed primarily for use with the present company complete pipe machine. However, it can easily be adapted to practically any existing company 2-in. machine. (The Oster Mfg. Co.)

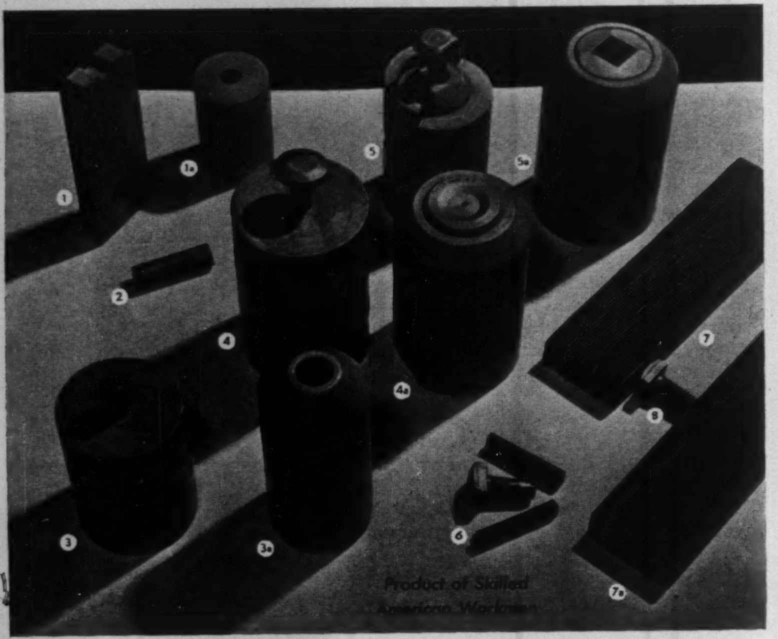


For more data write No. 142 on postcard, p. 177

Hand Seamer

Long a standard tool in the sheet-metal and allied industries, a hand seamer comes in two models. The tool features easy-set gages for precise and accurate crimping. The tool is also available without gages for application on a variety of changing operations, where speed is essential and ease of handling desirable. Both models are sturdily

COLUMBIA
TOOL
STEELS



TOOL STEELS IN USE: Tooling for fully automatic cold heading of bolts.

1 — Cut-off blade COLUMBIA EXTRA carbon tool steel
1a — Cutter plug COLUMBIA EXTRA HEADERDIE
2 — Bolt blank as cut off ready for heading
3 — First station die COLUMBIA EXTRA HEADERDIE body with MOLITE HW10 insert
3a — First station upsetter COLUMBIA EXTRA HEADERDIE
4 — Second station die COLUMBIA EXTRA HEADERDIE body with MOLITE HW10 insert
4a — Second station hammer COLUMBIA EXTRA HEADERDIE body with MOLITE HW10 insert
5 — Trim punch E-Z-DIE air hardening steel
5a — Trim die COLUMBIA EXTRA HEADERDIE with low carbon 18-4-1 high speed steel insert
6 — Pointers MAXITE super high speed steel
7 & 7a — Roll thread dies ATMODIE air hardening high carbon high chromium steel
8 — Finished Bolt

Tool Steel

COLUMBIA TOOL STEEL COMPANY
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Chicago Heights, Illinois

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550,000 POUNDS OF PRECISION

The Guillotine Shear's superior cut on heavy gauges, synchronized on the fly

Another Hallden First — type 76 Guillotine Flying Shear, the world's largest, for continuous strip shearing — up to ⅝″ thick, 100″ wide aluminum — at **two cuts per second.** This new Hallden installation can cut mild steel up to ⅜″ thick and 90″ wide, with cut lengths infinitely variable up to 48 feet. Change of cut length and synchronization may be made while the Shear is in operation. For every high-production shearing application consult the shearing specialists.

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constructed of forged tool steel, to give years of reliable, day-in and day-out service. Precision-machined crimping edges, vista-green finish and recognized quality construction are incorporated into both models of hand seamers. (The Peck, Stow & Wilcox Co.)

For more data write No. 143 on postcard, p. 177

Safety Clothing

A line of asbestos safety clothing sheds molten metal at 3000°F, without deterioration, loss of resiliency or discoloration of inner side. The specially-woven fabric offers 40- to 50-pct greater abrasion resistance than ordinary asbestos. It has nearly double the tensile strength of fabrics twice its weight and thickness. Garments made from the new fabric asbestos reflect about 50 pct of radiant heat, and are extremely light in weight. (American Optical Co.)

For more data write No. 144 on postcard, p. 177

Elapsed-Time Computer

In the metal-working industry one of the hardest cost factors to determine is shop order cost information and machine utilization time. An automatic elapsed time computer provides the metal-working industry with an answer to this problem. It is used either for single-item computation or as an integral component of any planned or existing cost-control system. The elapsed-time computer automatically computes and, at the same time, prints elapsed time, the difference between "start time" and "finish time" of a given operation. (Calculagraph Co.)

For more data write No. 145 on postcard, p. 177

Tumbling Machine

Vibratory barrel tumbling machines feature electromagnetic vibratory drives for deburring, cleaning, descaling, or most any parts finishing job. The amplitude of vibration can be instantly varied, while the same frequency of 3600 vibrations per minute is maintained. A turn of the rheostat knob on the control box is all that is required to change the amplitude. (Syntron Co.)

For more data write No. 146 on postcard, p. 177

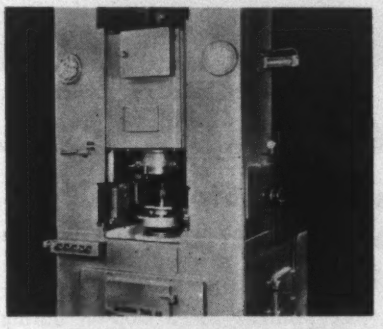
Electrodes

For consumers using ½-, ⅝- and ¾-in. electrodes in their work, these new electrodes fill the bill. The need for this item became apparent as higher current densities came into common use with these sizes. An accompanying thermal shock can cause spalling and splintering off of electrodes manufactured from other conventional materials. This problem has been eliminated with the new composition electrode. (Arcair Co.)

For more data write No. 147 on postcard, p. 177

Gear Shapers

Added to a gear-shaper line, are two new twin-column machines. They come in two sizes: one model for gears from 3-5 in. and the other for gears from 5-7 in. Multiple single-point tools feed toward the center, while the work reciprocates up and down to produce all teeth or forms on the contour of the work at the same time. Twin-column construction, with integral crosshead at top, permits chip removal through rear of machine. (Michigan Tool Co.)



For more data write No. 148 on postcard, p. 177

Polishes, Deburrs

Combined with nitric acid and water, a powder forms a solution for chemically polishing and bright dipping zinc die castings. The solution may be used before plating to

Eastman Kodak uses . . .

FEDERAL-WARCO

At Eastman Kodak, Warco straight-side presses turn out millions of close-tolerance, high-quality parts for Kodak cameras and motion picture projectors.

Precision, quality and high volume are Kodak watchwords. Federal-Warco plays a vital role in helping Kodak meet its rigid production requirements consistently.

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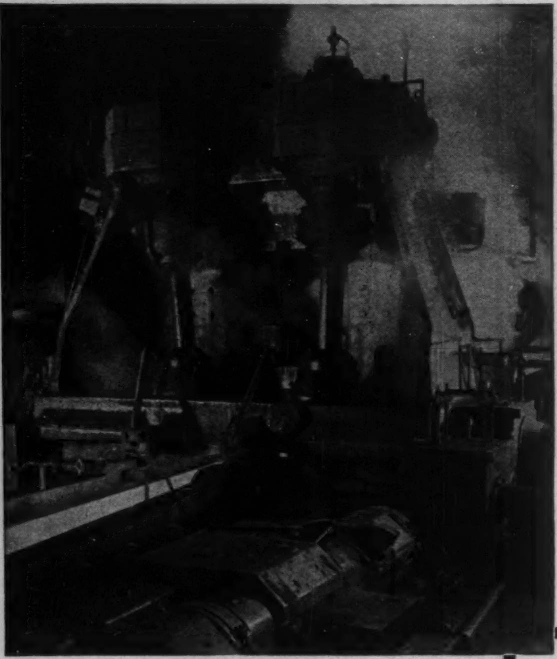

Edging hot strip steel

No place for second-best equipment. That's why this heavy-duty vertical overdrive edger uses rugged Cone-Drive **double-enveloping worm gearing** to drive the vertical rolls continuously.

Rugged Cone-Drive gearing is available in gearsets, speed reducers and gearmotors.

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DIVISION MICHIGAN TOOL CO.
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PUNCHES · DIES · RIVET SETS
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MARCHANT
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CHICAGO 8, ILL.

Write for Catalog 60 and Stock List

brighten the subsequent plate. It may be used to improve the appearance and corrosion protection of die castings used without further finish. It may also be used to restore the finish to castings that have been spoiled through paint or plate stripping, corrosion in process of manufacturing. It produces an excellent finish for adhesion to paint or lacquer. (Conversion Chemical Corp.)

For more data write No. 149 on postcard, p. 177

Air Compressors

A line of higher-capacity, heavy-duty portable air compressors includes six portable units and a stationary unit. The portable units are equipped with gasoline 8-hp engines. The compressor is a two-cylinder, single-stage, pressure-lubricated model equipped with constant-speed unloader, safety valve, pressure gauge, drain, and two shut-off valves.

The compressor on all the units is built especially for hard use and low maintenance. Operation on the stationary unit is automatic—a pressure switch maintains tank pressure to preset limits, so that the compressor is started and stopped automatically, based on air demand. (Binks Mfg. Co.)

For more data write No. 150 on postcard, p. 177

Plating Stop-Off

Leaving no film of any type on metal when stripped away, a crystal-clear coating is suggested for use primarily as a stop-off during electroplating or painting operations. Since the coating exudes no oil when left standing at room temperature, it is ideal as a semi-permanent coating or a temporary protective coating to protect metals against corrosion. Its base plastic is cellulose acetate butyrate, which is clear in color and extremely resistant to darkening under heat. The formulation melts at 360°F in melting pot, and may be used at 320° to 350°F. The plastic shows no corrosion after the following cycle: 16 hours at 100°F; 100 pct

INNOCENTI mechanical division

Continuous Mill in operation at
DALMINE S.p.A. works in Costa Volpino, Italy

continuous mill

for the manufacture of seamless steel tubes and pipes

The Continuous Mill associated with the Stretch Reducing Mill in the double version for making tubes from $^3/_8$" to 4" and from $2^3/_8$" to 7" successfully meets present requirements for consistently higher quality and quantity.

- Highest Capacity: the annual production can reach respectively 150,000 and 250,000 tons in the two versions.
- Highest yield: 93% - from billet to tube
- Complete automation: 1,5 man hour per produced ton
- Possibility to make tubes with 2,25 mm minimum thickness without stretching
- Extremely easy to operate
- Low installation costs in respect of capacity.

These features make the Continuous Mill the most reliable tube making equipment for new installations or the modernization of the existing ones.

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why go "local" when you can take an "express"!

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LEVERPAK, the modern drum container for 12 gauge through 24 gauge, where wire must be kept clean and dry . . . and safe from handling damage. Provides long uninterrupted runs. (Finer gages than above also possible for Leverpak, on inquiry.)

Econo-Coil® Reel unwinds 1500# to 2500# *nonstop,* depending on finish and gage . . . the single length wire that slashes stop-and-go coil changing time, and cuts scrap loss as much as 90 percent! Econo-Coils® are shipped on returnable reels which stack for easy handling when full, or nest when empty to save space.

Econo-Coil® *Reel-less*—If you prefer you can specify Econo-Coils® individually bundled and strapped without reels.

Econo-Coils® can be furnished in a wide range of gages, in many finishes, tempers, and analyses of low and medium low carbon steels. Let us show you how we have helped others speed output and cut production costs . . . with Econo-Coil.®

Wire specialists for over half a century

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PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, KOKOTE, Flame Sealed, Coppered, Tinned, Annealed, Liquor-Finished, Bright and special shaped wire. Also Welded Wire Reinforcing and Galvanized Fabric, Nails, Continental Chain Link Fence, and other products.

relative humidity; 3 hours at —40°F; 2 hours at 160°F; 3 hours in 5 pct NaCL solution. (Fidelity Chemical Products Corp.)

For more data write No. 151 on postcard, p. 177

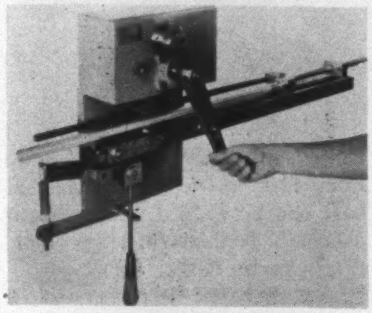
Inspection System

For production conveyor lines, low-cost, light sensing electronic inspection system detects and removes a great variety of imperfect items. This equipment can detect imperfections that create as small as 3-pct variation in light reflected or transmitted from the items being inspected. It is usable with conveyor belts up to 10 ft wide and at speeds up to 600 fpm. (Atronic Products Inc.)

For more data write No. 152 on postcard, p. 177

Graduating Machine

For marking accurate calibrations on aluminum, brass and other metal tubing, a graduating machine operates manually. A single rotation of the 8-in. diam marking wheel provides fractional graduations on a 24-in. tube. The operating handle is balanced to hold in any position. The marking accuracy is obtained through a gear and rack arrangement that insures a true length of calibration, over the 24-in. length. (The Acromark Co.)



For more data write No. 153 on postcard, p. 177

Heat-Resistant Gloves

Three new types of gloves reflect 90 pct of all radiant heat, in work where high temperatures are involved. The gloves have leather palms and aluminized asbestos backs and thumbs. This makes

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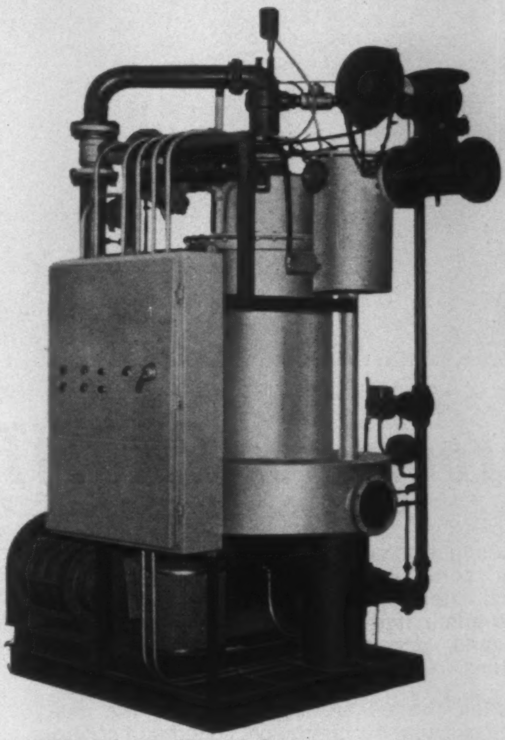
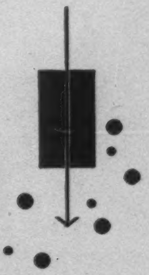
INERT GAS GENERATORS

Using the Sub-X Combustion Process

THERMAL utilizes unique principles of design to provide refineries, chemical processors, metallurgical plants, and other industrial users with a source of inert or purge gases that is compact in size and provides high outputs for low initial cost. Standard outputs range from 2,000 scfh to 60,000 scfh.



A 30,000 scfh Gas Fired Generator Ready for Use



SUBMERGED EXHAUST OF COMBUSTION PRODUCTS makes feasible the use of low-cost or contaminated water as coolant without concern over fouling of surfaces. The tank of water through which the gases pass provides an unusual degree of safety. Heat transfer efficiency is extremely high.

REFRACTORY IS ELIMINATED and maintenance costs reduced through the use of the high heat release THERMAL burner which can be fired with gas, distillate oil, or dual fuel. Units are supplied as a complete package and include all control and safety equipment.

For detailed information write for
Bulletin #114-B

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Effective production and storage space is increased . . . lifting, conveying and stacking are done more quickly and cheaply, with fewer men . . . and rehandling is eliminated—when your plant is equipped with a rugged, dependable, **"Job-Mated"** crane by Shepard Niles.

Shepard Niles Cranes are supplied with the exact combination of capacity, clearance, speed and controls you need to assure more efficient and profitable plant operation. Whichever one best meets your precise job conditions, it will be built to the same high quality standards that have made Shepard Niles America's largest, most relied upon, manufacturer of hoists and cranes.

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Makers of cranes from 500 lbs. to 500 tons

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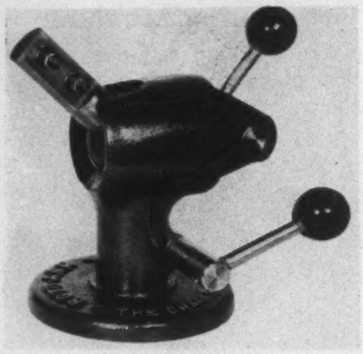
them particularly suitable for welding and cutting operations, furnace work, or any other operation where extreme radiant heat is an important factor in efficient operation. The backs of the gloves are a combination of asbestos and a special heat-resistant fabric. Extremely flexible, the material is light, fully insulating and will neither crack nor peel even under the severest working conditions. (Air Reduction Sales Co.)

For more data write No. 154 on postcard, p. 177

Holding Device

A multi-purpose holding and assembly-speeding device rigidly holds work loads of up to 70 lb, at any angle. The device has an arm for attachment of work loads, which can be moved up and down from 110° to vertical. Swivel at base can be rotated 360° without changing vertical angle position. (The Charles Parker Co.)



For more data write No. 155 on postcard, p. 177

Refractory Brick

For continuous service at operating temperatures up to 2600°F or more, in metallurgical and ceramic furnaces, a semi-silica refractory brick contains about 75 pct silica. Principal applications are in roofs of hot-metal mixers; roofs and sidewalls of heating furnaces; sidewalls of openhearth regenerators; blast-furnace stove domes and sidewalls; soaking-pit sidewalls and roofs; and in ceramic tunnel and periodic kilns. Outstanding features are: unusual volume stability

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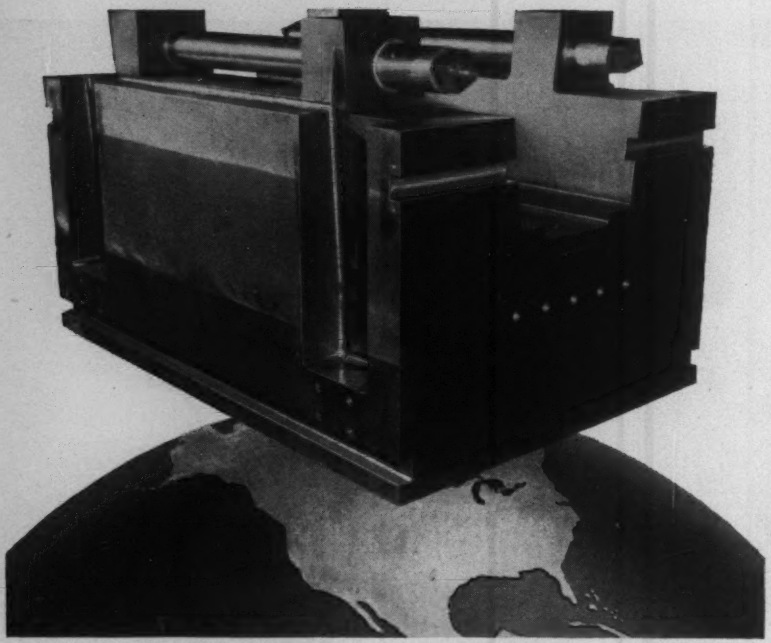

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In this rarefied atmosphere, unwanted hydrogen, oxygen, non-metallic inclusions, and other impurities are literally boiled out of the molten steel, producing cleaner, tougher, stronger, more ductile, flaw-free products.

This 36,000 pound, 40" x 44" x 64" die holder is used in a heavy duty press. It was made of Finkl FX analysis, Temper 4, and finished machined in our shops.

All Finkl die blocks and hot work die steels are made from vacuum degassed electric furnace material produced in our own melt shop. Because of the clean, greatly improved qualities, you get more forging production, less downtime due to breakage, and savings in fewer tool regrinds.

You get more from Finkl in quality, continuing research, and engineering service. Call your Finkl representative for your forging, hot work die steel, and die block needs.

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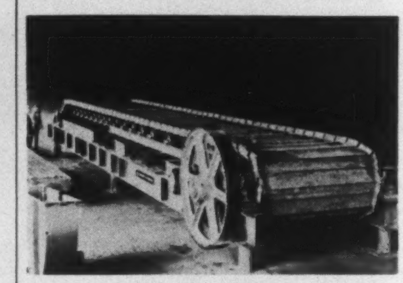
and load bearing ability at top operating temperatures, and excellent resistance to structural spalling. In the presence of alkali vapors, a protective glaze forms on the hot face of the brick which prevents penetration of furnace gases into the refractory brick and resultant damage. (H. K. Porter Co., Inc.)

For more data write No. 156 on postcard, p. 177

Pan Feeder

Ninety-inches wide, and 45-ft long, a pan feeder weighs 165,000 lb. It was designed for use with a crusher station that delivers copper ore. (Taylor-Wharton Co.)



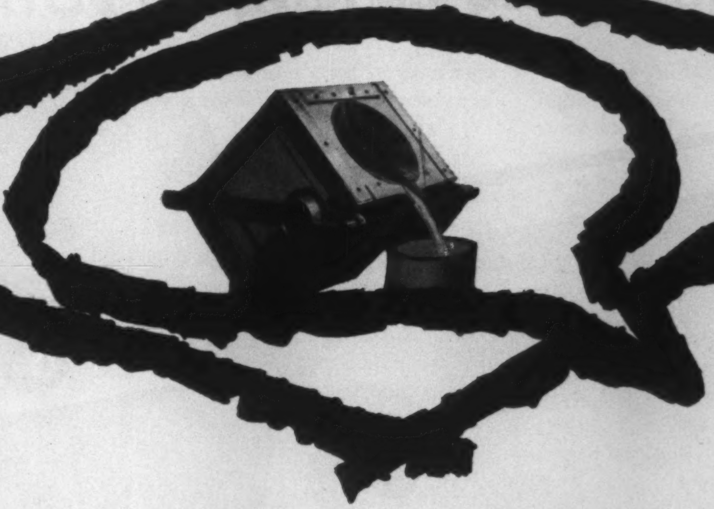
For more data write No. 157 on postcard, p. 177

Bundling Machine

Fully automatic, a bundling machine packages a wide range of piercing billets, extrusion billets and wire bars into uniformly-shaped, tight bundles. Two machines in tandem handle both round billets up to 5-in. diam. and wire bars up to 4-in. square, in lengths up to 72 in. The round billets are bundled in a hexagonal pattern, while the square wire bars are stacked in a square arrangement. The provision of two machines in tandem allows one bundle to be strapped, either manually or by power strappers, and discharged, while the next bundle is being built up in the other machine. A powered roller conveyor feeds the billets to the bundling machine from such prior operations as casting, sawing, cupping, scalping or inspection. The individual billets are picked up by a lifter and are moved by loading levers into a transfer arm. (Loma Machine Mfg. Co. Inc.)

For more data write No. 158 on postcard, p. 177

WHY BIG THINGS ARE HAPPENING IN INDUCTION MELTING



Everybody likes change! Particularly the kind of money-saving changes introduced by Inductotherm to induction melting in the past seven years.

To the basic advantages of induction melting, Inductotherm has added features that assure lower costs by simplifying installation, speeding operation, and reducing service requirements.

- Inducto® power feed through tilting furnace trunions cuts the cost of pit construction; saves power losses by reducing cable length.
- Rigid, heliarc welded furnace frame construction improves furnace life and lining life.
- Prepackaged, pretested Inducto control centers take the time, trouble, and expense out of control installation; make start-up swift, sure, and easy.
- The most space-saving induction melting systems ever available are the Inducto "Integral" series, which package motor-generators, capacitors, transformers and all controls *in one compact console!*

Big things are happening in induction melting because Inductotherm is making them happen. But the biggest innovation has been the Inductotherm concept of service. Not just fast repairs and overnight replacement of any parts . . . but the fact that *Inductotherm is in business to fit induction melting to your needs.* We will do everything in our power to improve our equipment and the induction technique, never asking you to trim your requirements to the limitations of our equipment.

If you'd like more information on Inductotherm furnaces, write for Bulletin 70. But, for a taste of Inductotherm service, ask to have an engineer call. Inductotherm Corporation, 412 Illinois Avenue, Delanco, New Jersey.

INDUCTOTHERM

For some pointers on steel plate savings . . .

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This illustrated 16-page booklet outlines the Steel Plate Shapes Service available from Lukens Steel Company; describes scores of typical shapes produced on Lukens facilities; points out the cost-cutting features of this "pre"-fabricating service: *savings* on steel freight costs, scrap handling expense, shop spoilage, capital investment. For your free copy, simply fill in and mail this coupon.

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The Iron Age Summary

Hope Fades for Early Upturn

October may have to be written off as a turning point as no new buying trends develop.

Light buying, stable prices, and inroads of other materials pile up to hold back steel recovery.

▪ In the absence of any new buying trends, a significant upturn in steel operations is set back again.

This means that October may have to be written off as a recovery month, just as September was a few weeks ago.

More Orders, Smaller Tonnage—There is a slight seasonal upturn in orders, characterized by greater volume of orders, but for smaller tonnages. Of the major markets, only the automotive industry and its suppliers are taking anything like a respectable tonnage.

And this is less than expected because automakers went into the new model year with better-than-expected inventories. It has been assumed that auto steel stocks would be bare and the new models would result in a great surge of new orders for a big production surge of new cars.

Consumption Down—The present recession in steelmaking can no longer be classed as an inventory correction period. Cutbacks in inventories have been the big single factor, but actual consumption of steel has not snapped back.

The steel industry confidently expected operations to rebound to the high 70's (as a percent of capacity) when the summer months passed and the inventory correction ended. The fact that this did not happen put the blame on steel consumption.

March Upturn? — This means that a major, long-term improvement may now be out of the question this year. In some steel circles, next March is now looked for as the recovery time.

These factors are significant in the low state of steel operations:

Other than automotive, the traditional big steel users are not buying steel in any great quantity. This group includes appliance makers, who have inventory problems of their own, and railroads, which, with poor profit showings, are not replacing and repairing rolling stock more than the absolute minimum.

No Artificial Factors—There are no artificial factors to stimulate buying, such as the probability of a price increase or a strike threat. In fact, price hikes, which were once considered inevitable late this year, are now out of the question in the opinion of most steel men.

Inroads of other materials, long talked about in metalworking, are now showing significant results.

Warehouses are fighting for business and have not stepped up their own mill buying to any great extent.

Actually, steel troubles began to back up as early as last April when inventories of finished products, semi-finished parts and components began to pile up in manufacturing plants.

The inevitable cutting back of steel purchases followed. Manufacturers still are not satisfied with their inventories and only as little steel as possible is being ordered.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,503	1,401	1,558	356
Ingot Index				
(1947-1949=100)	93.6	87.2	97.0	22.2
Operating Rates				
North East Coast	56.0	53.0	62.0	12.0†
Buffalo	59.0	55.0*	59.0	0.0†
Pittsburgh	44.0	38.0*	49.0	27.0†
Youngstown	42.0	36.0	45.0	10.0†
Cleveland	52.0	45.0*	51.0	0.0†
Detroit	72.0	70.0*	77.0	24.0†
Chicago	60.0	58.0	58.0	5.0†
Cincinnati	55.0	53.0*	55.0	68.0†
St. Louis	72.0	64.0	68.0	97.0†
South	47.0	50.0*	59.0	12.0†
West	56.0	52.0*	49.0	0.0†
U. S. Rate	52.7	49.2	54.7	12.6

*Revised †IRON AGE Estimates

Source: American Iron and Steel Institute

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$31.83	$32.50	$32.50	$41.50
No. 2 bundles	$23.17	$22.50	$22.17	$28.00
Nonferrous				
Aluminum ingot	26.00	26.00	26.00	26.80
Copper, electrolytic	33.00	33.00	33.00	30-31.50
Lead, St. Louis	11.80	11.80	11.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	102.375†	102.75	103.625	102.50
Zinc, E. St. Louis	13.00	13.00	13.00	11.00

Guide to Value Analysis Issued

The National Association of Purchasing Agents has issued a new manual as value guide to buyers.

Intended for "uninitiated," the manual ranges from definitions to applications.

- Whether you are a one-man purchasing department or a single buyer in a large corporation, there is real opportunity to practice value analysis. What's the pay-off to you as a buyer? Three things: Fun, advancement and profit.

This is the message carried in the latest manual issued by the National Association of Purchasing Agents. Title of the manual: Value Analysis.

For Purchasing Men—The booklet deals with value analysis "solely in terms of the purchasing man's interests and areas of activity." It is addressed, "not to the sophisticate, but to the uninitiated."

Here are the first lines of the booklet: "It is the purpose of this manual to provide a quick, concise, yet complete review of value analysis—what it is, what benefits it can offer, how to organize for it, how to use it."

Merely being cost conscious or participating in cost reduction programs is **not** value analysis according to the NAPA manual. Value analysis must be, "a continuing evaluation process." And the main objective is to "determine the proper item or service for the function desired."

Analyze Function — Adds the manual: "A purchasing man can do a good job of filling a requisition and yet not be involved at all in value analysis." A buyer, before obtaining the item requisitioned should first determine what is the function of the part, material or service that is being requisitioned.

SEARCH FOR VALUE: Purchasing agents join engineers and production men in hunt for functional value at clinic run by Value Analysis, Inc.

A case in point is made in a requisition for a shovel. Investigation may indicate that for the type of digging to be done, a spade might be better—or a post hole auger. The point is made that, "a major effort on the part of the purchasing man to do the best possible job in buying shovels would have been fruitless if he should have been buying another form of digging device to more effectively provide value for the function involved."

After the function is determined, the buyer's knowledge of markets and competition come to the fore. He has determined "what to buy," and now he meets the challenge of "how to buy."

If buyers do not inquire about the functions of the items requisitioned then they are, "nothing more than purchase order clerks," states the publication.

Look at Methods—Also pointed out: Value analysis concerns itself with methods as well as materials. An example is seen in a buyer who visited a steel supplier and noticed sheet coils had replaced former flat sheet inventories. A check showed that a decoiling, flattening machine was used with good results and big savings. Being a heavy user of sheet, the buyer arranged to buy coils from the mill and have them flattened by a converter of coils to sheet. He made a 6.4 pct saving in his buying operation.

One of the personal pay-offs to practicing value analysis is termed, "fun." This means the pleasure and personal satisfaction that a person gets from doing something creative.

The manual can be obtained by non-members of the NAPA for one dollar. Address NAPA, 11 Park Place, New York 7, N. Y.

"Bridge" the cost gap with a NEW
EUCLID TROLLEY
on your PRESENT CRANE BRIDGE!

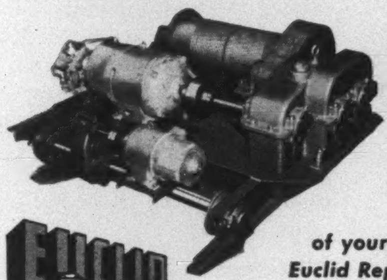
If your present overhead crane facilities require attention, it may be wise to investigate the possibilities of a crane remodeling job with new Euclid trolleys; available in a range of designs and capacities.

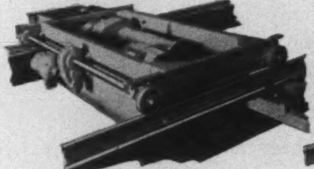
We can specifically cite instances where this plan has been employed to the complete satisfaction of the crane owners.

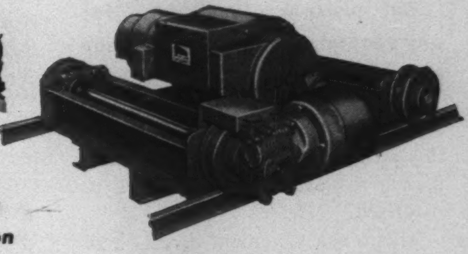
This Heavy Duty Series "M" trolley incorporates a three reduction spur gear hoist. Recommended for use on cranes subjected to continuous operation in the handling of heavier loads.

This submerged crane trolley is designed to meet the low headroom conditions which are more prevalent in existing low buildings today with the wide use of air conditioning in many industrial plants.

A Series "H" top running trolley with a worm gear drive used in double girder cranes in capacities of 3 to 15 tons.







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> "Before trying Kroil on heat treat trolleys we broke off every nut . . . since then, we have not lost one."

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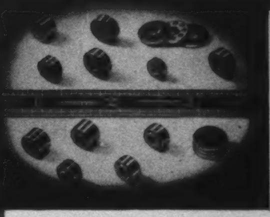

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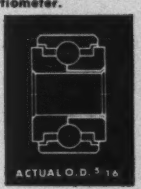
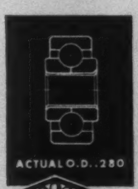
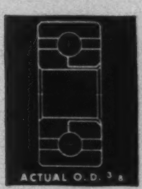
No. 6035-1 — Rear support bearing for print wheel carriage on electronic potentiometer.



No. 6034-1 — Idler clutch bearing on 8 mm motion picture projector.



No. 6713 — Gear support bearing in parking meter mechanism.



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What Will Improve Plate Market?

Plate mill sales managers are searching for some signs of a pickup in orders.

But prospects are poor for any real improvement before the end of the year.

▪ "If the plate market improves this year," says an East Coast sales manager, "even the mills will be surprised."

This frank statement reveals how discouraged plate producers are about a market pickup. They can't find any signs of coming buying support from major users. These include construction, shipbuilding, linepipe, and fabricating. Even defense orders are at reduced levels, some mills report.

Hunt for Sales—Customers who are purchasing are taking only small tonnages and specifying and getting rapid delivery. Mill salesmen are hunting for business, sometimes urging regular accounts to place tonnage or step up the size of orders.

Users who normally order large tonnages each month are now reluctant to take even a carload. In one case, a buyer placed tonnage for October, November, and December equal to only one month's previous order.

End of the Line—After receiving the order, mill sales officials checked with the customer and asked if another order would be placed. They were told no more tonnage would be needed this year.

The plate sales recession is strongest on the East Coast. But other areas are also feeling the slowdown. Linepipe demand in the Midwest had been aiding plate orders there. But this flurry of activity is dying. As a result, a Chicago area plate mill expects to run through its backlog by the middle of this month.

Sheet and Strip — Apart from auto industry orders, the market is lagging. Other buyers are placing spot orders, sometimes to fill inventory holes. Customers can count on getting rapid mill delivery. Along the **East Coast,** galvanized sheet is one of the few flat-rolled items showing any life. At **Cleveland,** mills will probably operate around 50 pct in October. This would be at the same rate as in August and September. Some orders from auto stampers are helping support the sheet market there.

Sheet mills in the **Midwest** are operating at about 75 pct of capacity. Among the principal buyers are auto accounts and warehouses. In that market, galvanized sheet is showing strength, after slipping off in August.

PURCHASING AGENT'S CHECKLIST

With steel capacity ample, mills will stress customer service, says E. J. Hanley, president, Allegheny Ludlum Steel Corp. P. 113

There are two new trends in machine tool design—more tape controls and more miniature tools. P. 115

New developments in steelmaking are pushed by research. P. 153

Aluminized Sheet — Buying of aluminized remains stronger than for other sheet grades. Deliveries in the **Midwest** range from 2 to 4 weeks. One aluminized sheet supplier, Republic Steel Corp., has discontinued production for the moment. The company had been turning out experimental lots of the product. It may possibly re-enter the market with a remodeled sheet line at the company's Warren, O. mill.

Bar—Orders are showing slight improvement with the main interest coming from auto industry buyers. However, the market is still generally slow. **Cleveland** area mills report some ordering from auto forgers and screw machine products producers. At **Chicago,** some bar mills are down to ten turns a week. Cold-finishers can make fast shipment.

Structurals—The market is "fair to poor," according to an **East Coast** sales manager. Buyers are ordering only for their immediate needs. Fabricators are placing a few orders. However, the tonnage is generally small. Buyers in the **Midwest** are not ordering as much as might be expected.

Wire — Keystone Steel & Wire Co., Peoria, Ill., has started production of heavy, wide mesh fabric for use in concrete construction jobs. The new material, heavier than anything available from foreign producers, is made with rod up to ½ in. in diameter. These provide mesh in widths up to 17 ft.

Service Centers—Sales for this month should be better than August, possibly by about 5 pct. But, at the most, this is only a "creeping" gain, say warehouse officials. They are encouraged, however, by an increase in inquiries.

Heavier use of slitting lines by **Midwest** service centers probably doesn't reflect an increase in demand. Apparently the distributors are getting large numbers of small tonnage sales. These require frequent changes in slitting facilities to process orders.

COMPARISON OF PRICES

(Effective Sept. 13, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Sept. 13 1960	Sept. 6 1960	Aug. 16 1960	Sept. 15 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Sept. 13 1960	Sept. 6 1960	Aug. 16 1960	Sept. 15 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila	$70.57	$70.57	$70.57	$70.57
Foundry, South Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$31.50	$31.50	$31.50	$43.50
No. 1 steel, Phila. area	34.50	34.50	34.50	40.50
No. 1 steel, Chicago	29.50*	31.50	31.50	40.50
No. 1 bundles, Detroit	28.50	28.50	29.50	39.50
Low phos., Youngstown	35.50	35.50	37.00	45.50
No. 1 mach'y cast, Pittsburgh	47.50	47.50	47.50	53.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	52.50
No. 1 mach'y cast, Chicago	45.50*	47.00	47.00	61.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$31.83*	$32.50	$32.50	$41.50
No. 2 bundles	23.17*	22.50	22.17	28.00
Coke, Connelsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.50-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00	33.00	30-31.50
Copper, Lake, Conn.	33.00	33.00	33.00	31.50
Tin, Straits, N. Y.	102.375†	102.75	103.625	102.50
Zinc, East St. Louis	13.00	13.00	13.00	11.00
Lead, St. Louis	11.80	11.80	11.80	12.80
Aluminum, ingot	26.00	26.00	26.00	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago. Philadelphia, Buffalo and Birmingham

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Market Slumps In Midwest

A scrap market break which started a week ago in Chicago is beginning to spread.

St. Louis prices are also down. Other key areas are inactive and it doesn't look like activity will increase this month.

▪ Scrap dealers in several key areas suffered setbacks this week as markets became even softer.

Prices in Chicago are down considerably as a market break that started last week begins to spread. Export prices are off as much as $2. Brokers are buying less and less scrap and the quoted price for No. 1 heavy melting is down to $29.

In fact, the IRON AGE No. 1 heavy melting composite price for scrap is down to $31.83. Last week it stood at $32.50. One year ago the composite price was $41.50.

Lower prices also prevail in St. Louis where two mills have completely pulled out of the market. Other areas remain inactive with very little prospect for activity before the end of September.

Now that the Pennsylvania Railroad strike is settled, Pittsburgh dealers are back in business. Some dealers there are optimistic, but the fact remains that there is still no heavy movement of scrap. In Philadelphia, scrapmen report that the strike was of such short duration that it actually had little effect on business. Had it continued much longer, the export activity would have suffered.

Pittsburgh — Settlement of the Pennsylvania Railroad strike put local yards back in business this week and raised hopes for an early end to local railroad disputes. Some brokers feel these developments may have a strengthening effect, but there's still no heavy scrap movement. Shipments covered by old orders are being released in small quantities by one mill. Early railroad lists show little change from last month.

Chicago — The market sagged sharply as mills purchased small tonnage at reduced prices. Export prices slipped off as much as $2. The market collapse began last week as a mill offered $31 for No. 1 heavy melting. Later, a smaller purchase moved at $30. Broker buying offers are off at least $2. Industrial grades weathered the decline in slightly better shape, but are off $1.

Philadelphia — Nothing exciting has happened this week and the market continues to move along with "poor" domestic action and "fair" export activity. Dealers claim they aren't building inventories and a real buying spree by local mills might find some items hard to get. The rail strike ended before any damage was noticed in export.

New York — The market rolls along at the same pace it has maintained all summer. Rail strikes, rain, hurricane weather and the end of vacations have not changed the market. Only stainless shows any signs of real weakness because domestic demand is not picking up as expected.

Detroit — Inactivity marks the state of the market. It gives dealers a depressed feeling and no pickup is expected for the rest of the month. Exporters are the only ones interested in buying, but shipments to Canada are generally the result of month-old orders.

Cleveland — Only a few very small orders are disturbing an otherwise becalmed market. A mill bought small tonnage from restricted yards for $33. And some foundry scrap went for $35 plus a $1 springboard. Auto lists are going to fill old orders.

Cincinnati—Dealers are hoping some upriver markets develop to take up slack from local mills which refuse to enter the market. But for now they are selling at a penalty and would rather sit it out.

St. Louis—Lower prices prevail in this market. Two mills have completely pulled out of the market for the present time. This, along with a flooding of the market with out-of-the-district scrap, has depressed prices.

Birmingham—A confused market appears to be attempting adjustment. With the exception of openhearth consumers, nearly everyone is in the market for small amounts. But they seem uncertain about prices as dealers' supplies dwindle.

Buffalo — There were no sales this week and no new activity is expected before late in the month. As a result, there were no price changes.

Boston — It's the same picture. No domestic movement and very little export activity. Prices remain unchanged.

West Coast—Export continues as the sole prop in this market. However, haggling with the Japanese is now going on over final quarter contracts. There is still talk that the Japanese will buy less, at reduced prices.

Houston — A district mill has dropped out of the market after buying at slightly higher prices. Intake improved somewhat with new posting. A flurry of foundry buying raised the price on cupola cast by $1. There is little export activity.

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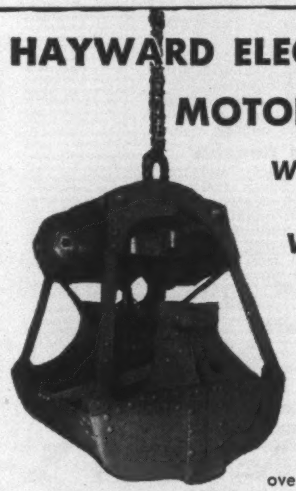

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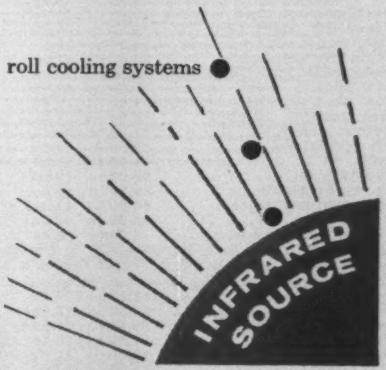

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SCRAP PRICES

(Effective Sept. 13, 1960)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	38.00 to 39.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	38.00 to 39.00
Heavy turnings	27.00 to 28.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	45.00 to 46.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	36.00 to 37.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	90.00 to 95.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	30.00 to 32.00
No. 1 factory bundles	36.00 to 37.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	13.00 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Low phos. forge crops	40.00 to 41.00
Low phos. punch'gs plate, ¼ in. and heavier	36.00 to 37.00
Low phos. 2 ft. and under	34.00 to 35.00
No. 1 RR hvy. melting	33.00 to 34.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	52.00 to 53.00
Rails 2 ft. and under	46.00 to 47.00
Angles and splice bars	42.00 to 43.00
RR steel car axles	50.00 to 51.00
RR couplers and knuckles	39.00 to 40.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	40.00 to 41.00
Cast iron wheels	31.00 to 32.00
Malleable	44.00 to 45.00
Stove plate	34.00 to 35.00
Steel car wheels	38.00 to 39.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	85.00 to 90.00
430 turnings	40.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	23.00 to 24.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. 2 ft punch'gs	39.00 to 40.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	27.00 to 28.00
RR specialties	39.00 to 40.00
Rails, 18 in. and under	51.00 to 52.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	40.00 to 41.00
Malleable	45.00 to 46.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	10.00 to 11.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	35.00 to 36.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	50.00 to 51.00
No. 1 cupola cast.	37.00 to 38.00
Hvy. breakable cast.	31.00 to 32.00
Drop broken cast.	49.00 to 50.00

Youngstown

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	35.00 to 36.00

Cleveland

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	33.50 to 34.50
No. 2 bundles	19.00 to 20.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft. & under	37.00 to 38.00
Low phos. punch'gs plate	32.00 to 33.00
Drop forge flashings	31.00 to 32.00
Foundry steel, 2 ft. & under	34.00 to 35.00
No. 1 RR hvy. melting	34.50 to 35.50
Rails 2 ft. and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	47.00 to 48.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	39.00 to 40.00
Malleable	45.00 to 46.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	75.00 to 80.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 busheling	29.00 to 30.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Low phos. plate	36.00 to 37.00
Structurals and plate, 2 ft. and under	38.00 to 39.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft. and under	47.00 to 48.00
No. 1 machinery cast.	46.00 to 47.00
No. 1 cupola cast.	40.00 to 41.00

St. Louis

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	27.00 to 28.00
Foundry steel, 2 ft.	30.00 to 31.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	20.00 to 21.00
No. 1 RR hvy. melting	33.00 to 34.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	41.00 to 42.00
RR specialties	38.00 to 39.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	35.00 to 36.00
Stove plate	37.00 to 38.00
Cast iron car wheels	35.00 to 36.00
Rerolling rails	52.00 to 53.00
Unstripped motor blocks	36.00 to 37.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	32.00 to 33.00
Elec. furnace, 3 ft. & under	34.50 to 35.50
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft.	38.00 to 39.00
No. 1 RR hvy. melting	30.00 to 31.00
Scrap rail, random lgth.	39.00 to 40.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	38.00 to 39.00
No. 1 cupola cast.	47.00 to 48.00
Stove plate	47.00 to 48.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	34.00 to 35.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turnings	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	33.00 to 34.00
Heavy breakable cast.	31.00 to 32.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	25.00 to 26.00
Drop forge flashings	25.00 to 26.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Heavy breakable cast.	30.00 to 31.00
Mixed cupola cast.	34.00 to 35.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	60.00 to 65.00
430 bundles and solids	60.00 to 65.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	25.00 to 26.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	25.00 to 26.00
Machine shop turn.	5.00 to 6.00
Shoveling turnings	8.00 to 9.00
Clean cast. chem. borings	12.00 to 13.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	27.50 to 28.50

San Francisco

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	30.00
No. 2 bundles	20.00
Machine shop turn.	$14.00 to 15.00
Cast iron borings	14.00 to 15.00
No. 1 cupola cast.	46.00

Los Angeles

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 1 dealer bundles	27.00
No. 2 bundles	17.00
Machine shop turn.	13.00
Shoveling turnings	15.00
Cast iron borings	$15.00 to 16.00
Elec. furnace 1 ft. and under (foundry)	42.00 to 43.00
No. 1 cupola cast.	44.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

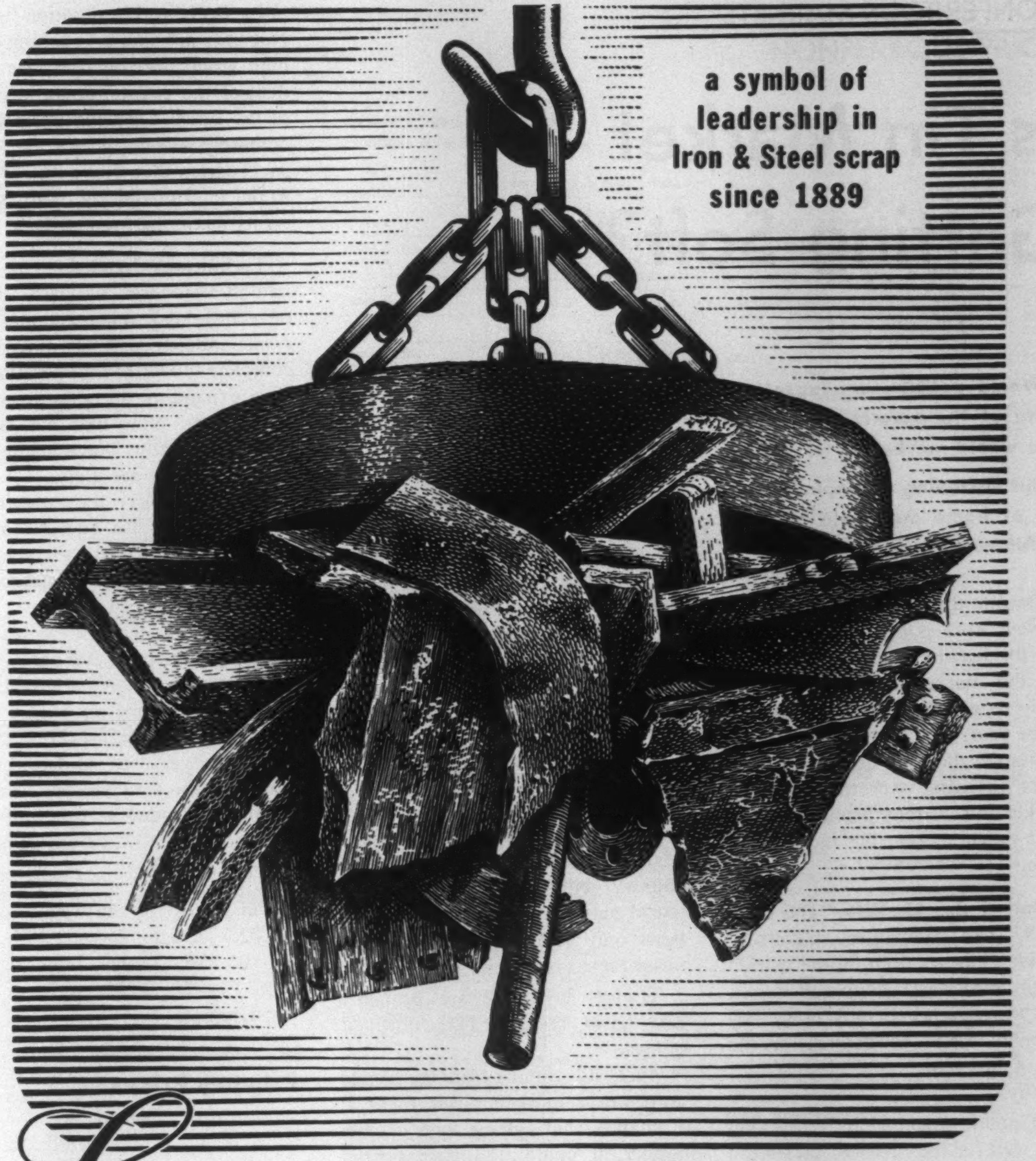
Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$25.80
No. 2 hvy. melting cut 3 ft. and under	22.50
No. 1 dealer bundles	25.80
No. 2 bundles	19.00
Mixed steel scrap	16.00
Bush., new fact., prep'd	25.50
Bush., new fact., unprep'd	20.45
Machine shop turn.	12.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	33.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	31.00
No. 2 bundles	18.00
Machine shop turn.	12.00
Shoveling turnings	14.00
Cut structural plate 2 ft. & under	$40.00 to 41.00
Unstripped motor blocks	26.00 to 27.00
Cupola cast.	33.00 to 34.00
Heavy breakable cast.	25.00 to 26.00



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Is Tin Market Getting Soft?

World politics are upsetting some of the normal flow of tin into world markets.

But softening of tinplate market at home may hold the key to future tin prices.

▪ Despite the fact that the tin price at New York is perched at over $1 per lb, leading traders in the city say the market is bad. Nor is it likely to get any better for the rest of the year.

Despite the long list of "ifs" and "buts" hanging over the world tin market the current problem comes right down to one big factor—tinplate.

Out of the Market—"The large U. S. steel companies, makers of tinplate, haven't been on the market for tin in at least a couple of weeks. And the way things look now, they probably won't be buying for the rest of the year."

Why?

"Tinplate making moved along very well for the first half of 1960," he says. "Then, can companies made some cancellations which slowed things down considerably in the third quarter. Just recently, there have been additional cancellations and deferments which have slowed production to a walk, and left steel companies with large stocks of both tin and finished tinplate."

Europe Holds Price Up—What has been holding the price up? Booming demand in Europe. This has been so for most of the year, so that shipments from producers have been adjusted so there is only a slight surplus of spot tin now in the U. S.

The dropping of export curbs for the fourth quarter, by the International Tin Council, actually came as no surprise to most U. S. dealers. In fact, they say it is almost meaningless.

In order to prevent a surplus of tin on world markets, the ITC had been restricting exports by major producers for the last few years. But the fact is that in the last few quarters only Malaya shipped its quota.

Why Quotas Were Dropped—A Malayan spokesman said that the country will keep close tabs on world markets. It will increase exports only at a rate which will not upset the current price pattern.

Traders say there are probably two basic reasons ITC dropped quotas.

Tin is still coming from the Congo onto world markets. But there is a chance that, along with Congo copper, it could disappear behind the Iron Curtain. ITC doesn't want to give the Congo government the excuse that it couldn't sell all it needed to on world markets to boost its sick economy.

Delicate Situation—Also, two of the countries falling farthest behind their quotas were Bolivia and Indonesia. New quotas would have to give some of this to Malaya.

One observer, in the U. S., of world tin markets suggested that the situations in both countries are a little touchy, and that ITC didn't want to step on any toes.

In Bolivia the situation is bad. Not only are sources running out of high grade ore, but the vice president of the country is the president of the union. And his membership definitely will not go for the austerity program that would be necessary to put the Bolivian tin industry back on its feet.

Technicians Needed—The problem in Indonesia, basically, is lack of technicians. When Indonesia became independent, it inherited a complete blueprint for operating and even expanding tin operations from the Dutch. Now that has run its course, and the Dutch technicians that drew it up are gone.

Tin traders say they aren't concerned about the success of the aluminum can. And they point out that the new, lighter tinplate uses just as much tin.

One thing traders suggest tin consumers keep an eye on: The International Tin Council aimed, with its quotas, to come out with a slight surplus on world markets at the end of a year. It underestimated consumption for the first half of 1960. With quotas off, and consumption down, it should come out all right in 1960.

Tin prices for the week: Sept. 7—102.375; Sept. 8—102.375; Sept. 9—101.875; Sept. 12—102.25; Sept. 13—102.375*.

* Estimate

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	33.00	35.00	3/11/60
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.80	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

ALUMINUM: 99% Ingot COPPER: (E) — electrolytic, (CS) — custom smelters, electrolytic. (L) — lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 249.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand, Grade	......	67.9	69.0	77.9	103.1
AZ31B Spec.	......	93.3	96.9	108.7	171.3
Tread Plate	......	70.6	71.7	......	......
Tooling Plate	73.0	......	......	......	......

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)	37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting)	40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	....	48.68	58.78
Muntz Metal	53.20	....	48.26	....
Momm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	....	52.21	....
Phos. Bz. 5%	77.44	....	78.10	....

Free Cutting Brass Rod 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.	29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be	$65.00
Beryllium copper, per lb conta'd Be	$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading	$70.00
Bismuth, ton lots	$ 2.25
Cadmium, del'd	$ 1.50
Calcium, 99.9% small lots	$ 4.55
Chromium, 99.8% metallic base	$ 1.31
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Germanium, per gm, f.o.b. Miami, Okla., refined	29.95 to 36.95
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$75 to $85
Lithium, 98%	$9.00 to $12.00
Magnesium sticks, 10,000 lb.	57.00
Mercury, dollars per 76-lb flask f.o.b. New York	$208 to $210
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel	69.60
Palladium, dollars per troy oz.	$24 to $26
Platinum, dollars per troy oz.	$82 to $85
Rhodium	$137 to $140
Silver ingots (¢ per troy oz.)	91.375
Thorium, per kg.	$43.00
Vanadium	$ 3.65
Zirconium sponge	$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot	
No. 115	29.25
No. 120	28.25
No. 123	27.25
80-10-10 ingot	
No. 305	33.75
No. 315	31.50
88-10-2 ingot	
No. 210	42.00
No. 215	38.75
No. 245	34.00
Yellow ingot	
No. 405	23.75
Manganese bronze	
No. 421	28.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	25.25-25.50
0.60 copper max.	25.00-25.25
Piston alloys (No. 132 type)	27.00-28.00
No. 12 alum. (No. 2 grade)	23.75-24.25
108 alloy	24.25-24.75
195 alloy	26.75-27.75
13 alloy (0.60 copper max.)	24.75-25.00
AXS-679 (1 pct zinc)	24.00-25.00

(Effective Sept. 13, 1960)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½%	24.75-25.75
Grade 2—92-95%	23.50-24.50
Grade 3—90-92%	22.50-23.50
Grade 4—85-90%	22.00-23.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25¾	25
Comm. bronze	26½	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26¾
No. 2 copper wire	25
Light copper	22¾
*Refinery brass	23
Copper bearing material	22

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26¾
No. 2 copper wire	25
Light copper	22¾
No. 1 composition	21½
No. 1 comp. turnings	21
Hvy. yellow brass solids	16¼
Brass pipe	14¾
Radiators	17¼

Aluminum

Mixed old cast.	13½—14
Mixed new clips	14½—15½
Mixed turnings, dry	14 —14½

Dealers' Scrap

(Dealers' Buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	23½—24
No. 2 copper wire	21½—22
Light copper	19½—20
Auto radiators (unsweated)	13¼—13¾
No. 1 composition	18 —18½
No. 1 composition turnings	16½—17
Cocks and faucets	13¾—14¼
Clean heavy yellow brass	12¾—13¼
Brass pipe	14¼—14¾
New soft brass clippings	14½—15
No. 1 brass rod turnings	13¼—13¾

Aluminum

Alum. pistons and struts	7½— 8
Aluminum crankcase	9½—10
1100 (2s) aluminum clippings	12½—13
Old sheet and utensils	9½—10
Borings and turnings	5½— 6
Industrial castings	10 —10½
2020 (24s) clippings	12½—13

Zinc

New zinc clippings	7 — 7¼
Old zinc	4½— 5
Zinc routings	3¼— 3½
Old die cast scrap	2¾— 3

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	23-23.50
Clean Monel turnings	16.50-17
Old sheet Monel	22-23
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed.	15

Lead

Soft scrap lead	8 — 8¼
Battery plates (dry)	3 — 3¼
Batteries, acid free	2 — 2¼

Miscellaneous

Block tin	79 —80
No. 1 pewter	59 —60
Auto babbitt	43 —44
Mixed common babbitt	10¼—10¾
Solder joints	14½—15
Siphon tops	41
Small foundry type	9¾—10¼
Monotype	9¾—10¼
Lino. and stereotype	8¾— 9
Electrotype	7½— 7¾
Hand picked type shells	5¼— 5¾
Lino. and stereo. dross	2¼— 2¾
Electro dross	2¼— 2¾

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP						
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Castle, Pa.									7.425* *M10*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective Sept. 12, 1960)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special-coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3,Y1*	6.275 *U1, I3,Y1*	6.875 *U1, I3*	6.775 *U1, I3,Y1*	7.225 *U1*	7.525 *U1, Y1,I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1,Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3,P6*	6.275 *U1, J3,P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3,P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3,W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2,R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

? Electrogalvanized sheets.

(Effective Sept. 12, 1960)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5 675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925* *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, B5*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher.

(Effective Sept. 12, 1960)

* Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alan Wood Steel Co., Conshohocken, Pa.
A3	Allegheny Ludlum Steel Corp., Pittsburgh
A4	American Cladmetals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angel Nail & Chaplet Co., Cleveland
A7	Armco Steel Corp., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A9	Acme-Newport Steel Co., Newport, Ky.
A10	Alaska Steel Mills, Inc., Seattle, Wash.
B1	Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2	Bethlehem Steel Co., Pacific Coast Div.
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin, Inc., Harvey, Ill.
B6	Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7	A. M. Byers, Pittsburgh
B8	Braeburn Alloy Steel Corp., Braeburn, Pa.
C1	Calstrip Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C4	Claymont Products Dept., Claymont, Del.
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia Geneva Steel Div., San Francisco
C8	Columbia Steel & Shafting Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Pittsburgh, Pa.
C11	Crucible Steel Co. of America, Pittsburgh
C13	Cuyahoga Steel & Wire Co., Cleveland
C14	Compressed Steel Shafting Co., Readville, Mass.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Conners Steel Div., Birmingham
C18	Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1	Detroit Steel Corp., Detroit
D2	Driver, Wilbur B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
D4	Dickson Weatherproof Nail Co., Evanston, Ill.
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire-Reeves Steel Corp., Mansfield, O.
E3	Enamel Products & Plating Co., McKeesport, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
F2	Fitzsimons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owenboro, Ky.
H1	Hanna Furnace Corp., Detroit
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif.
K2	Keystone Steel & Wire Co., Peoria
K4	Keystone Drawn Steel Co., Spring City, Pa.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Mercer Tube & Mfg. Co., Sharon, Pa.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M7	Milton Steel Products Div., Milton, Pa.
M8	Mill Strip Products Co., Evanston, Ill.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M10	Mill Strip Products Co., of Pa., New Castle, Pa.
N1	National Supply Co., Pittsburgh
N2	National Tube Div., Pittsburgh
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle
N7	Newman Crosby Steel Co., Pawtucket, R. I.
N8	Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9	Nelson Steel & Wire Co.
O1	Oliver Iron & Steel Co., Pittsburgh
O2	Oregon Steel Mills, Portland
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Steel Corp., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Portsmouth Div., Detroit Steel Corp., Detroit
P8	Plymouth Steel Co., Detroit
P9	Pacific States Steel Co., Niles, Cal.
P10	Precision Drawn Steel Co., Camden, N. J.
P11	Production Steel Strip Corp., Detroit
P13	Phoenix Mfg. Co., Joliet, Ill.
P14	Pacific Tube Co.
P15	Philadelphia Steel and Wire Corp.
R1	Reeves Steel & Mfg. Div., Dover, O.
R2	Reliance Div., Eaton Mfg. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roebling Sons Co., John A., Trenton, N. J.
R5	Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon Pa.
S2	Sheffield Steel Div., Kansas City
S3	Shenango Furnace Co., Pittsburgh
S4	Simonds Saw and Steel Co., Fitchburg, Mass.
S5	Sweet's Steel Co., Williamsport, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S9	Superior Steel Div. of Copperweld Steel Co.
S10	Seneca Steel Service, Buffalo
S11	Southern Electric Steel Co., Birmingham
S12	Sierra Drawn Steel Corp., Los Angeles, Calif.
S13	Seymour Mfg. Co., Seymour, Conn.
S14	Screw and Bolt Corp. of America, Pittsburgh, Pa.
T1	Tonawanda Iron Div., N. Tonawanda, N. Y.
T2	Tennessee Coal & Iron Div., Fairfield
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Strip Div., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T7	Texas Steel Co., Fort Worth
T8	Thompson Wire Co., Boston
U1	United States Steel Corp., Pittsburgh
U2	Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3	Ulbrich Stainless Steels, Wallingford, Conn.
U4	U. S. Pipe & Foundry Co., Birmingham
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheatland Tube Co., Wheatland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Div., Buffalo
W7	Wilson Steel & Wire Co., Chicago.
W8	Wisconsin Steel Div., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wyckoff Steel Co., Pittsburgh
W12	Wallace Barnes Steel Div., Bristol, Conn.
Y1	Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities		Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	City Delivery‡ Charge	Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	......	......	......	......
Baltimore**	$.10	8.37	9.71	10.16	10.78	8.94	9.63	9.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.60	9.45	8.41	8.47	8.26	13.14	16.76	......	......	......
Boston**	.10	9.77	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	8.80	9.95	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.70	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.02	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72^1	10.13	11.39	11.01	8.80	9.45	8.81	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	......	......	......	20.84
Detroit**	.15	8.98	10.61	10.65	11.26	8.93	9.62	9.01	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	10.03	12.19^3	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.36	11.02	11.50	11.02	9.25	9.95	9.46	11.72	17.17	15.87	21.87	21.12
Los Angeles**		9.59^1	11.29	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.99	10.20	......	11.39	10.27	10.48	10.07	12.89	......	......	......	......
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	8.84	11.04	17.24	16.24	21.24	20.49
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	......	......	8.90	8.65	9.20	8.90	10.70	......	......	......	......
Philadelphia**	.10	8.95	10.10	10.76	10.95	9.30	9.95	9.35	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	8.70	11.40	17.10	16.10	19.70	20.45
Portland**		10.20	12.05	12.35	12.20	10.35	10.80	10.20	16.65	18.50	17.45	20.75	20.25
San Francisco**	.10	10.27	11.79^2	11.55	11.88	10.48	10.59	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.75	10.68	11.09	8.77	9.29	8.92	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.74	10.99	11.16	8.83	9.33	8.97	11.64	......	16.69	......	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Sept. 12, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*			
Birmingham *W9*	62.00	62.50*	66.50		
Birmingham *U4*	62.00	62.50*	66.50		
Buffalo *R3*	66.00	66.50	67.00	67.50	
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	
Chester *P2*	68.00	68.50	69.00		
Chicago *I4*	66.00	66.50	66.50	67.00	
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50			
Geneva, Utah *C7*	66.00	66.50			
Granite City *G2*	67.90	68.40	68.90		
Hubbard *Y1*			66.50		
Ironton, Utah *C7*	66.00	66.50			
Lyles, Tenn. *T3*					73.00
Midland *C11*	66.00				
Minnequa *C6*	68.00	68.50	69.00		
Monessen *P6*	66.00				
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*		66.50	67.00	67.50	
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00		66.50	67.00	
So. Chicago *R3*	66.00	66.50	66.50	67.00	
So. Chicago *W8*	66.00		66.50	67.00	
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66-00	66.50	66.50	67.00	
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*			66.50		

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31–0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

‡Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, (Globe Div.), $78.00; Niagara Falls (15.01–15.50), $101.00; Keokuk (14.01–14.50), $89.00; (15.51–16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Discount Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	43.75	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8*; Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* wensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa , *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Discount Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Sept. 12, 1960)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187		212	193	9.00	9.55
Aliquippa *J3****	173	190			190	9.00	9.675
Atlanta *A8***	173	191		212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*						9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*						9.00	9.55
Cleveland *A6*							
Cleveland *A5*						9.00	
Crawf'dsv. *M4***	175	193		214	199	9.10	9.85
Donora, Pa. *A5*	173	187		212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187		212	193	9.00	9.55
Galveston *D4*	9.10‡						
Houston *S2*	178	192		217	198	9.25	9.80†
Jacksonville *M4*	184-1	197		219	203	9.10	9.775
Johnstown *B3***	173	190	177		196	9.00	9.675
Joliet, Ill. *A5*	173	187		212	193	9.00	9.55
Kokomo *C9**	175	189		214	195*	9.10	9.65*
L. Angeles *B2****						9.95	10.625
Kansas City *S2**	178	192		217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*						9.30	9.85*
Pittsburg, Cal. *C7*	192	210			213	9.95	10.50
Rankin Pa. *A5*	173	187			193	9.00	9.55
So. Chicago *R3*	173	187			193	8.65	9.20
S. San Fran. *C6*				236		9.95	10.50
SparrowsPt. *B3***	175			215	198	9.10	9.775
Struthers, O. *Y1**						8.65	9.20
Worcester *A5*	179					9.30	9.85
Williamsport *S5*							

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	......	......	......	......	......	......	......	......
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	......	......	......	......	......	......	......	......
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50	......	......	......	......	......	......	......	......
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	......	......	......	......	......	......	......	......
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	......	......	......	......	......	......	......	......
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	......	......	......	......	......	......	......	......
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	......	......	......	......	......	......	......	......
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	......	......	......	......	......	......	......	......
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50	......	......	......	......	......	......	......	......
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	......	......	......	......	......	......	......	......
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	......	......	......	......	......	......	......	......
Fontana *K1*	*6.25	......	*2.25	......	0.75	......	1.25	......	1.75	......	2.25	......	2.75	......	......	......	......	......	......	......	......	......
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	......	......	......	......	......	......	......	......
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50	......	......	......	......	......	......	......	......
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	139.8
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.0
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.7

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No matter what material your product demands Mundt can supply the exact perforation you need. Steel, brass, copper, monel, bronze, aluminum, zinc, tinplate, lead, stainless steel, coated metals, bonded materials, plastics, and paper are punched as required for every functional and ornamental need.

You can count on Mundt's guarantee that sheets are perfectly flat, straight, parallel on the sides, and free from buckle or camber.

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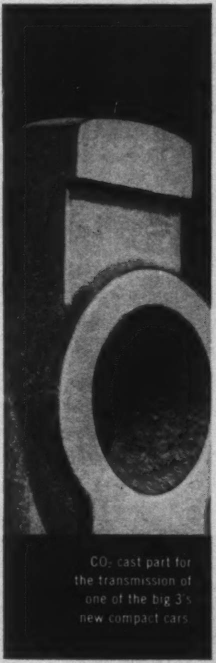

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LUDINGTON, MICH.

SPECIALISTS IN STACK-, CO₂, AND SHELL-MOLD CASTING

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 65-71% Cr, .30-1.00% max. Si.

0.02% C	41.00	0.50% C	33.25
0.05% C	34.00	1.00% C	33.00
0.10% C	33.75	1.50% C	32.75
0.20% C	33.50	2.00% C	32.50

3-5% C, 53-63% Cr, 2.5% max. Si	26.00
4-6% C, 58-63% Cr, 3-6% Si	22.50
5-8% C, 58-63% Cr, 3-6% Si	22.50
6-8% C, 50-56% Cr, 4-7% Si	22.00
4.00-4.50% C, 60-70% Cr, 1.2% Si	28.75
0.025% C (Simplex)	35.00
0.010% C max, 63-66% Cr, 5-7% Si	34.50
0.25% C max	33.50
0.010% C max, 68-71% Cr, 2% Si max	34.50
0.25% C max	33.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C	$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	24.50	14.60
Ton lots	29.75	16.05
Less ton lots	31.35	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe

Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N Y., freight allowed max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload bulk	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 75 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.70
Ton lots packed in bags	16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

Mn	Palmerton, Pa. 10 lb, pig	Palmerton, Pa. 35 lb, down	Neville Is., Pa. 35 lb
16-19%	$98.00	$96.00	$100.50
19-21%	100.00	98.00	102.50
21-23%	102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads, bulk	34.25
Ton lots, palletized	36.25
250 to 1999 lb	39.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads (Bulk)	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.

Carloads bulk	11.60
Ton lots, packed	13.25
Carloads, bulk, delivered, per lb of briquet	14.00
Briquets, packed pallets, 2000 lb up to carloads	16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	14.60	75% Si	16.90
65% Si	15.75	85% Si	18.60
		90% Si	20.00

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb	2.40	3.30	4.55

(Effective Sept. 12, 1960)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound

Ton lots	$3.45
Less ton lots	3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage,

per gross ton	$120.00
10 tons to less carload	$131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots,

per lb contained Ti	$1.50
Less ton lots	$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $255.00

Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered .... $2.15 (nominal)

Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth,

Pa.	$1 49
bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy

35-40% del'd, carloads, bulk	26.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	$5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound .... 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots (packed)	$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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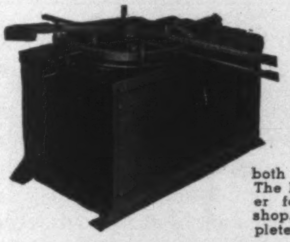
KARDONG FOUR-WAY BENDER

For Concrete Reinforcing Steel

Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes. Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

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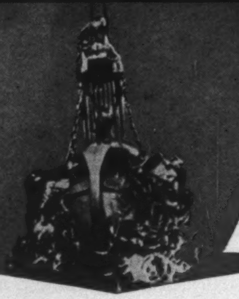

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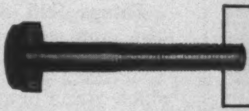
Close-tolerance accuracy which eliminates the need for costly machining is, in itself, a sound reason for specifying Ritco Forgings. A flawlessly smooth surface which helps speed product assembly is still another. Combine these advantages with a forged-in toughness which assures maximum impact resistance and fatigue strength at points of greatest shock and stress and it's easy to see why more and more design engineers write Ritco into their plans. *All* things considered, it will pay you to learn more about Ritco "Bright Finish" Forgings now. Send us your blueprints for estimates at no obligation.



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Farwest Business: Good or Fair?

Used machine dealers on the West Coast generally looked for 1960 to be a good year. Now many have started to change their minds.

Some areas report a slight increase in sales. And Seattle construction is causing machinery turnover.

■ What originally looked like a good year for West Coast used machine dealers is turning out to be only fair.

A leading area dealer puts it this way: "Everybody figured the year for a good one in used machinery sales. But it's turning out to be only fair. If more defense spending gets on the road before the year ends, we might see a spurt in the last quarter."

In the San Francisco Bay area, the trade reports a slight improvement in sales. But there are complaints that business is still far from good.

Another dealer believes the time is ripe for area machinery users to fill needs. He maintains prices are soft and even slashed hard on 10-year-old equipment. A milling machine, for example, recently sold for $5500. It would have brought $13,000 one year ago.

Things Still Slow — However, even with sharp price cuts nothing is moving too fast. Those machines which are in demand include grinders, lathes, milling machines, and other general purpose equipment.

A dealer, discussing the price situation, notes that 1940 machinery is now 20 years old. Therefore dealers will have to cut prices if they want to move the old stock. "They've got to catch up with reality," he says.

Only the hard-to-get merchandise is being purchased from the East.

Conversion Hopes — Some used machinery men report a fair volume of inquiries. They pin hopes on the conversion of inquiries into sales within the months ahead. However, others complain they aren't getting enough sniffling to keep life interesting.

Best sellers around the Southern California area include lathes, 18 in. and up; and vertical boring mills from 6 ft up. Small welders are also moving well, but big ones are dragging on the market.

Sheet metal equipment is still on top of the sales list. There are very few shears and press brakes around.

Seattle Is Strong—Seattle's used machinery market is strong. Dealers report adequate stocks and brisk trading in all lines.

Behind it is an unusually high level of summer industrial activity. Much of this is in heavy construction. Two major projects are in progress: a multi-million-dollar all-steel freeway bridge spanning the Lake Washington ship canal, and the Hood Canal Bridge. Preparations are also being made for a second Lake Washington bridge.

Many of the area's metalworking shops are sharing in these projects and find they must replace machinery faster than normal.

GUARANTEED—RE-NU-BILT

Electric Power Equipment — A. C. Motors

3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1750	G.E.	M-579B8	4800	1800
1	800	Whse	CW	500	1776
1	800	G.E.	MT-428	2200	450
1	600	Whse.	CW	220/440	900
1	600	Whse.	CW-4-32D-15	440	1778
1	550	Whse.	CW	440	252
1	500	Whse.	CW	550	350
1	300	A.C.	ANY	440/2300	720
1	300	G.E.	MTP561	2200	1800
1	250	G.E.	IM-16	220/440	875
1	250	A.C.	ANY	550	600
1	250	Cr.Wh.	Size 29Q	2300	350
1	250	G.E.	MT-424Y	4000	257
1	200	G.E.	IE-13B	220	1800
2	200	Whse.	CW-890	2300	1775
1	200	G.E.	IM	440	435
1	150	G.E.	IM-17	440	435
1	200	G.E.	IM	2200	580
1	125	G.E.	MT-557	220/440	1200
3	100	A.C.		440	695
1	100	G.E.	M-6335Z	220/440	580

SQUIRREL CAGE

1	500	G.E.	FT-559AY	2200	3600
2	500	Whse.	CSP-583H	440	3600
1	500	Whse.	CS-1115	2200	863/445
4	500	Whse.	CS-1216	2200	500
2	450	Ell.	F-3910	2200	1200
1	400	Whse.	CS-7151 610H	6600/4000	3585
1	300	Whse.	CS-1002	2300/440	600
1	250	Whse.	CS-8758	2200	1775
1	200	Whse.	CSP-5818	449	3450
2	200	Whse.	CS-8558 D.P.	220/440	1750
	200/150	Whse.	CS-963H	2300	1175/878
1	150	G.E.	FT-558	2200	875
1	150	Whse.	CS	440	580
1	125	Whse.	CS-764C	220/440	1160
3	100	Whse.	CS-760C	2200/440	1160
1	100	Whse.	B.B.CS-607-	220/440	1780

SYNCHRONOUS

1	6000	G.E.	ATI.8	200/6600	600
1	3500	G.E.	TS 1.0	4600/2300/4000	360
3	1750	G.E.	ATI	2300	3600
2	500	G.E.	TS-9569.8P.F.	2200	1200
1	400	G.E.	TS-7565	2200	1200
2	350	G.E.	ATI 1.0P.F.	2300	150
1	325	G.E.	ATI 1.0P.F.	440	1800
2	300	El Mach.	BRKT	2200	1200

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Qu.	KW	Make	D.C. Volts	A.C. Volts
2	3500	Al. Ch. (3-unit)	350	13800/4160
2	3000	Al. Ch. (3-unit)	600	13800/4160
1	2400	G.E.	300	4600/2300
1	2290	G.E.	600	13800/4160
1	1520	S. & S. (3-unit)	600	4000/2300
1	1500	G.E.	250	4600/2300
1	1250	G.E.	132/265	4160/2400
1	1000	G.E.	600	4000/2300
1	800	Whse. (3-unit)	250	4000/2300
1	750	G.E.	250	4000/2300
1	500	Whse. (3-unit)	250	4000/2300
1	500	G.E.	250	4000/2300
1	500	Whse.	125/250	4000/2300
1	400	G.E.	250	4000/2300
1	300	Whse.	125/250	400/2300
1	300	Al. Ch. (3-unit)	250	2300
3	250	Whse.	250	2300/440
2	200	G.E.	250/275	4000/2300
1	175	G.E.	250	4000/2300
1	150	Rel.	125	2300
1	150	G.E.	250/275	440
1	•125	G.E.	250	4000/2300
1	100	G.E.	250	4000/2300
1	75	G.E.	250	4000/2300
4	42	G.E.	250	440/220

DIRECT CURRENT MOTORS
Adjustable and Constant Speed
(Suitable for MILL and STANDARD DUTY)

Qu.	H.P.	Make	Volts	R.P.M.
1*	3000	G.E.	600	90/180
4**UN	3000	Whse.	600	600
3**UN	2700	G.E.	415	280
1**UN	2500	Whse.	700	108/162
1**UN	2200	Whse.	600	93/123
1**UN	2000	G.E.	350	230/350
1**UN	1750	G.E.	600	200/300
6**UN	1500	Whse.	600	600
1**UN	1400	G.E.	250	165/300
4**UN	750	Whse.	250	300/700
1*	750	Whse.	250	200/400
2**	645	S. & S.	300	350/1200
2*	600	Al. Ch.	600	300/600
1*	600	Whse.	230	110/220
2**	300	Whse.	230	300/600
2	235	Whse.	230	325/975
2	150	Whse.	230	400/1200
1	125	Whse.	230	575/850
3	125	Whse.	230	350/1125
1	125	Whse.	230	450/1050
1 UN	100	Whse.	250	350/700
1	100	Rel.	250	1150/1500

*—Ped. brg. mill type. **Ped. brg. forced ventilated. UN—Unused.

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920-Ton Toledo #60, Bed 47″ x 72″, Str. 20″, 1943
700/390-Ton Toledo #797E, Bed 127 x 83, Dbl. Act. Toggle, Air Clutch & Cushion
600-Ton Ferracute E601, Coining Press, Str. 6″, 30 SPM, 1950
440-Ton Bliss #210, Bed 37 x 36, 35 SPM, Side Shear, Str. 16″, Mfg. 1953
440-Ton Toledo #59¼, Bed 41 x 48, Str. 12″
255-Ton Toledo #58½B, Bed 43 x 42, Str. 12″
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Natco Horizontal Drill, 2 opposed B4F2 Head, 1943
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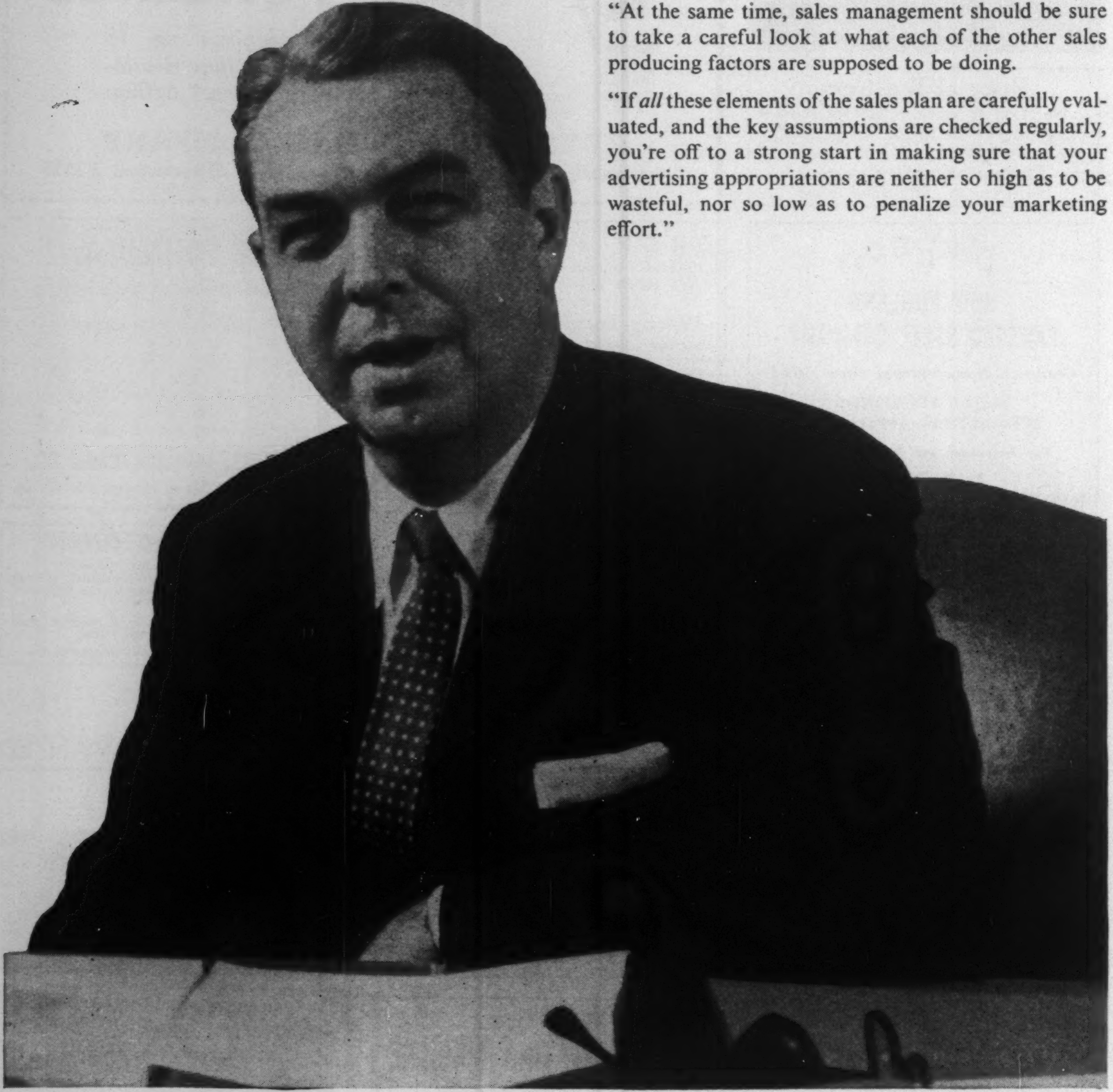

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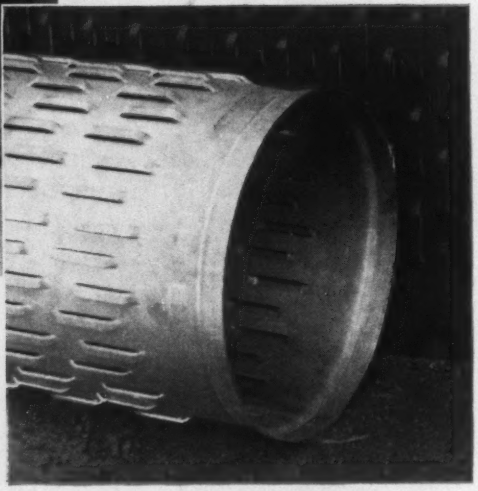

Above—Typical well screen fabricated by Doerr Metal Products. Twelve louvres are lanced and extruded in each stroke of the 500 ton Verson Press. Stock is up to $\frac{3}{16}''$ stainless or $\frac{1}{4}''$ mild steel. The tooling shown in the press at the left feeds the sheet automatically. The flat pieces are subsequently formed into sections ranging in diameter from 8″ to 48″. The press is also used for piercing operations on other products. Doerr Metal Products says, "Since we have put the press into service, we wonder how we ever operated without it."

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